The Intelligent Surveillance Solution

NAS NVRmini

User Manual

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1. Installation

1.1 Installation Process

Step 1: Unpacking the Unit

This package contains the following items:

- The unit
- Quick Start Guide
- Screws for disk drives (1 package)
- Power cord
- Warranty card
- 12V DC power transformer (2 bay unit)
- CD with **Install Wizard**, **Backup**, **Live View**, and **Playback** application, user manual, and quick start guide

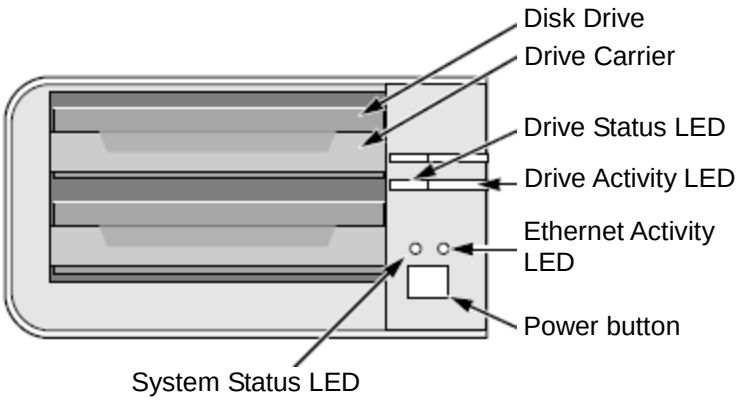
Warning

The electronic components within the unit are sensitive to damage from Electro-Static Discharge (ESD). Please take precautions at all times when handling the unit or its sub-assemblies.

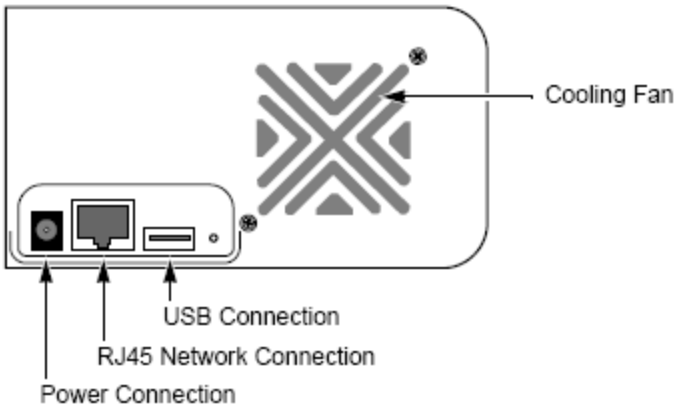
Important

To configure the unit, you must install the software onto a desktop/ laptop running Windows Vista, 2003, XP Professional, or 2000.

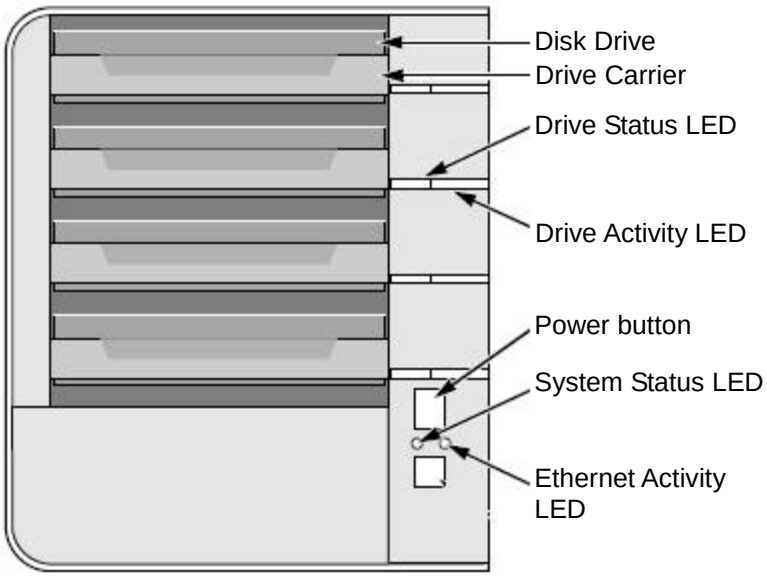
2 bay unit front view



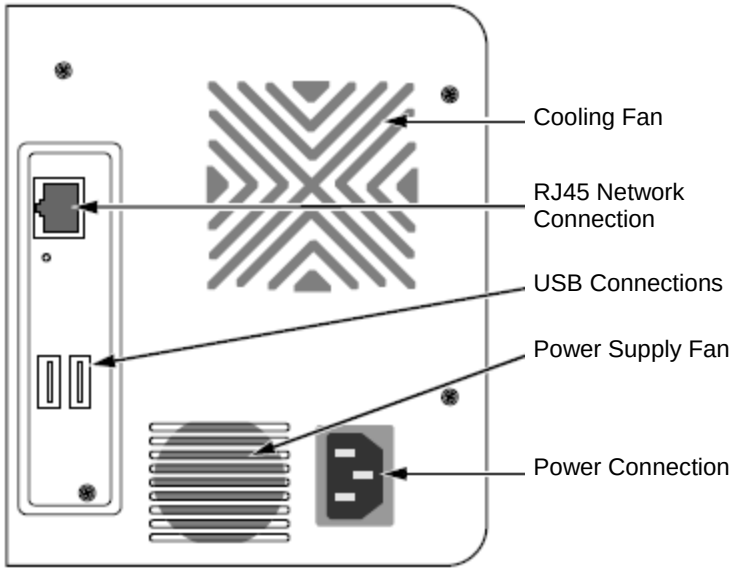
2 bay unit rear view



4 bay unit front view



4 bay unit rear view



Step 2: Disk Drive Installation

You can populate this unit with SATA 1.5 Gb/s or 3.0 Gb/s disk drives. For optimal performance, install disk drives of the same model and capacity. Your disk drives will become a RAID Volume on this unit.

1. Open the lid on the front of the unit enclosure.
2. Pull a disk drive carrier from the enclosure. See the front view figure.
3. Carefully lay the disk drive into the drive carrier, making the screw holes on the sides of the carrier align with the screw holes in the drive.
4. Insert the screws through the holes in the drive carrier and into the sides of the disk drive.

- Install only the counter-sink screws supplied with the unit.
- Install four screws per disk drive.
- Tighten each screw until snug. Be careful not to over-tighten.

5. Reinstall the drive carrier into the unit enclosure.
6. Repeat step 2 through 5 for the other disk drive.
7. Close the lid on the front of the unit.

Step 3: Connecting to the Network

1. Attach one end of the network cable to the RJ45 network connection. See the rear view figure.
2. Attach the other end of the network cable to your Ethernet hub or switch.

Important

If there are multiple networks at your facility, note the network to which you connect the unit. You will need this information during the setup process.

Step 4: Connecting the Power

1. Attach the power cord from the power source to the power adapter.
2. Connect the power adapter to the back of the unit enclosure. See the rear view figure.
3. On the front of the unit, press the power button. See the front view figure.

It takes about a minute for the unit to fully power up. After power-up:

- The System Status LED turns green. See the front view figure.
- The buzzer beeps one time.

Step 5: Software Installation

1. Insert the CD into your CDROM.
2. Double-click **Setup.exe** to begin installation.
3. Click the **Next** button to go on installation.
4. Click the "**I accept the terms of the license agreement**" option, and then click the **Next** button.
5. Insert your "User Name" and "Company Name" then click the **Next** button.
6. Select the setup type, and then click the **Next** button.
7. Click the **Install** button to proceed with installation.
8. When above-mentioned installation processes are finished, a final installation screen appears. Click the **Finish** button to close the installer.

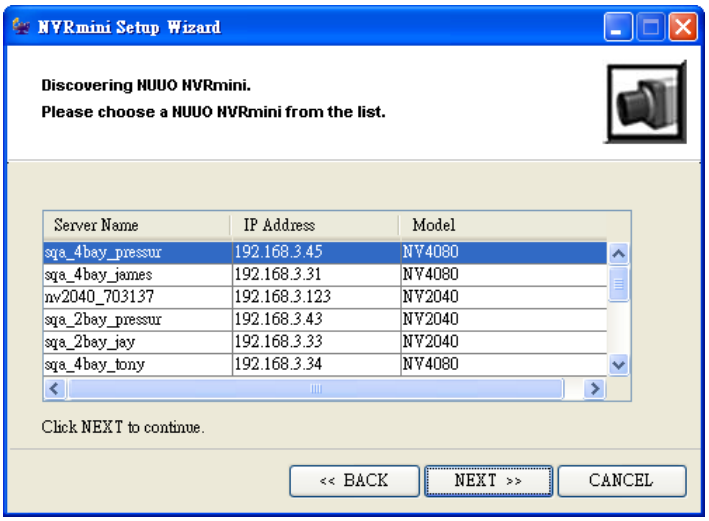
Step 6: Setting up the Unit

The software **Install Wizard** performs the setup procedures on your unit. After the procedure, you can begin using this unit.

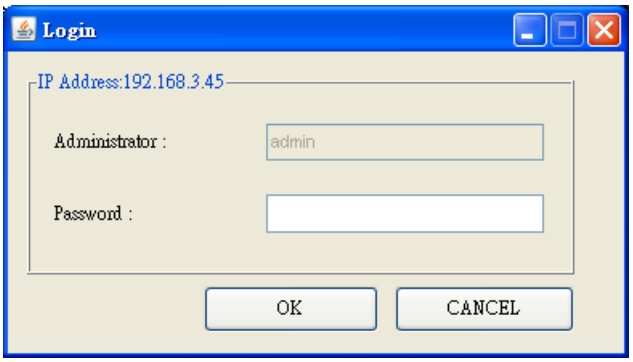
1. Startup > NUUO NVRmini > Install Wizard.
2. This program will show the default language setting and initiation mode.
3. Choose preferred language and initiation mode, and then click the **Next** button.

- **Express Mode**: you don't need to set the date, time, network settings, and RAID level. (After step 5, jump to step 9 directly.)
- **Advance Mode**: you need to set your specific date, time, and network settings.

4. **Install Wizard** program will search all the units on the Internet right now. Choose one of them, and then click the **Next** button.



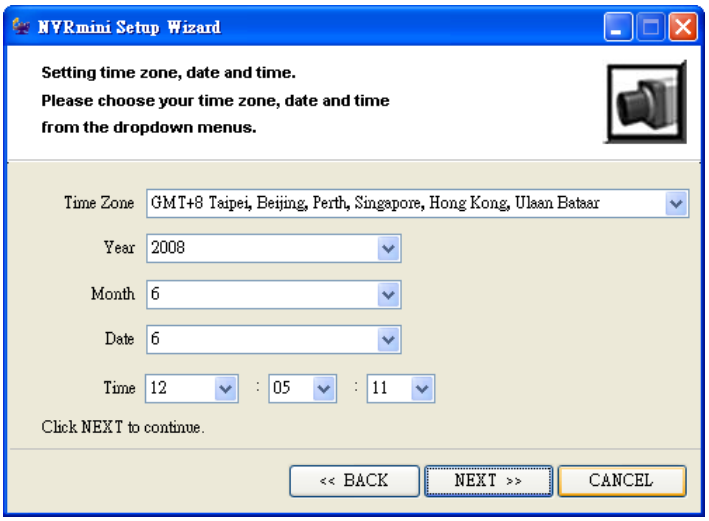
5. Enter your password, and then click the **OK** button.



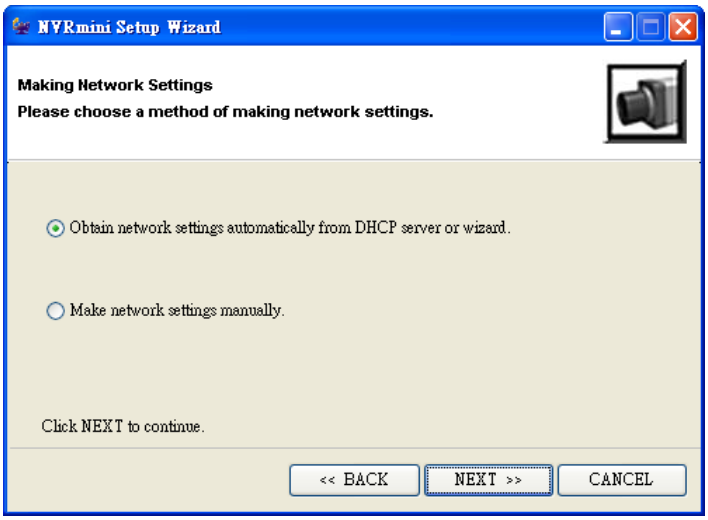
Note

The default Administrator password is “admin”.

6. Set the time zone, date, and time, and then click the **Next** button.

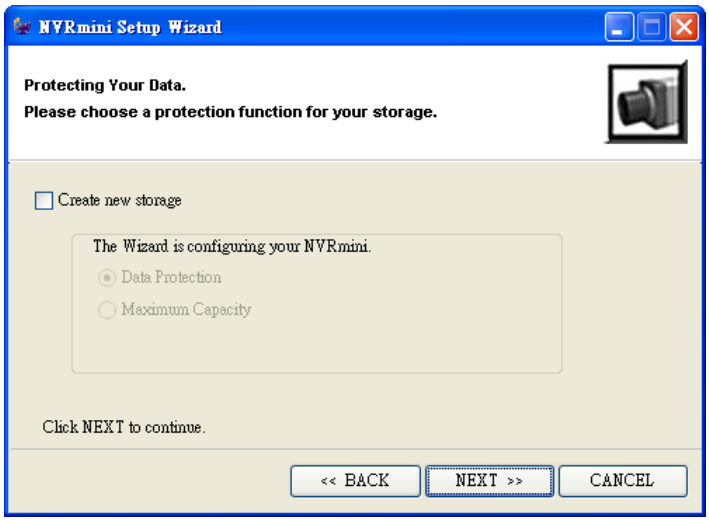


7. Choose the network settings, and then click the **Next** button.


NVRmini Setup Wizard
Making Network Settings
Please choose a method of making network settings.
Obtain network settings automatically from DHCP server or wizard.
Make network settings manually.
Click NEXT to continue.
<< BACK
NEXT >>
CANCEL

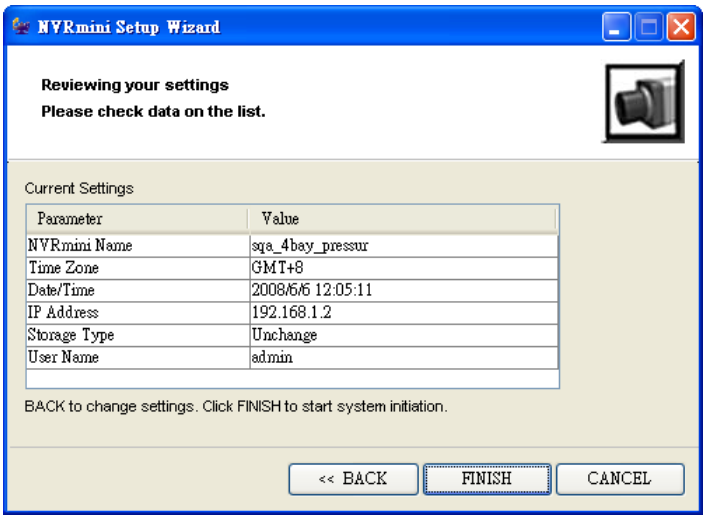
- **Obtain network settings automatically from DHCP server or wizard**: apply settings (such as IP, net mask, gateway, DNS) which are automatically generated by the DHCP server.
- **Make network settings manually**: individually select your specific settings.

8. If you need to set a new disk(s), check the "**Create new storage**" option. After checking, click the **Next** button.



- **Data Protection**: set the RAID level to RAID 1 (2 bay). Set the RAID level to RAID 5 (4 bay).
- **Maximum Capacity**: set the RAID level to RAID 0 (2 bay). Set the RAID level to RAID 0 (4 bay).

9. Review your settings. If the settings are correct, click the **Finish** button to finish the settings selection process.



Caution

Once you have finished the setting selection process, the unit will start working. In order to assure the stability of the unit, do not pull any disks out when the system is running.

1.2 LED Status Definitions

- **System Status LED**

	Green	Red	Amber
Definition	Healthy	Fail	Critical

- **Drive Status LED**

	Green	Red	Amber	Dark
Definition	Healthy	Fail	Rebuilding	Without disk

- **Drive Activity LED**

	Blink	No blink
Definition	Activity	No activity

- **Ethernet Activity LED**

	Green	Blink
Definition	Link	Accessing

2. Settings

After setting up the unit, log in to the system by entering its IP address in the browser (Internet Explorer 7 or above). When connecting, choose your language, enter the user name and password, and then begin using this system.

There are four main functions of this unit: settings, live view, playback, and logout. They will be shown on the top of the page.

2.1 Camera Setup

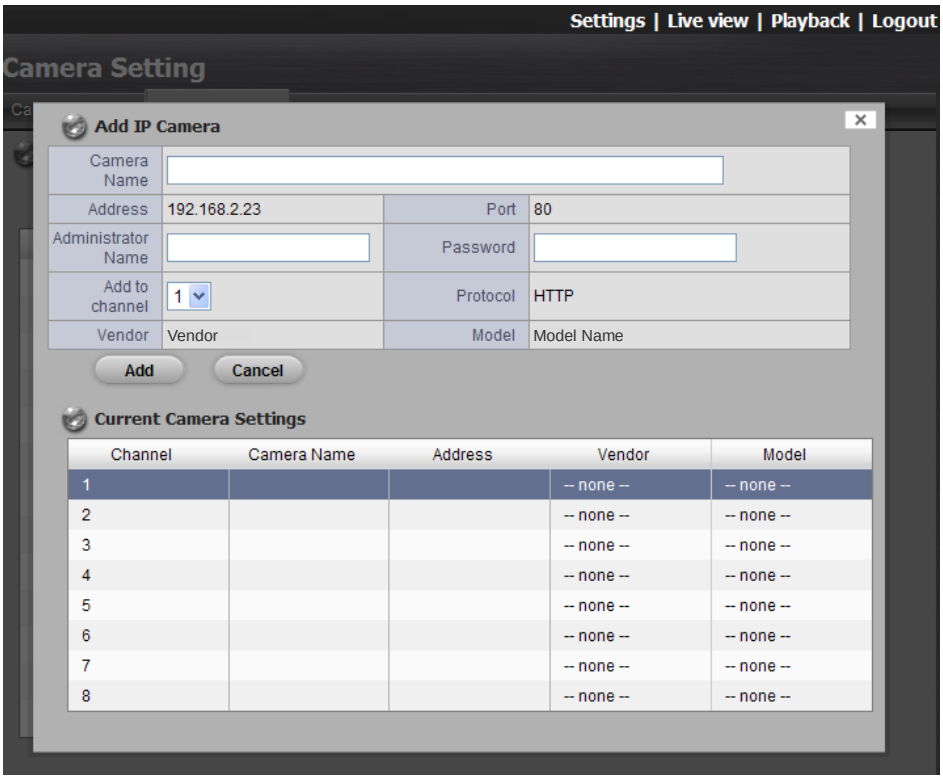
2.1.1 Add UPnP Cameras

The function enables user to automatically search and add cameras in the same network. Before searching UPnP cameras, make sure that the cameras possess UPnP function.

1. Open Internet Explorer and log in to the unit.
2. Click **IP Camera/ Camera Settings**.
3. Click the **Camera Search** tab.
4. Click the **Search** button to search for UPnP cameras.

5. The system will list all the currently available cameras. The inserted cameras are shown in blue. Click the ✚ icon to add a camera into your camera list.

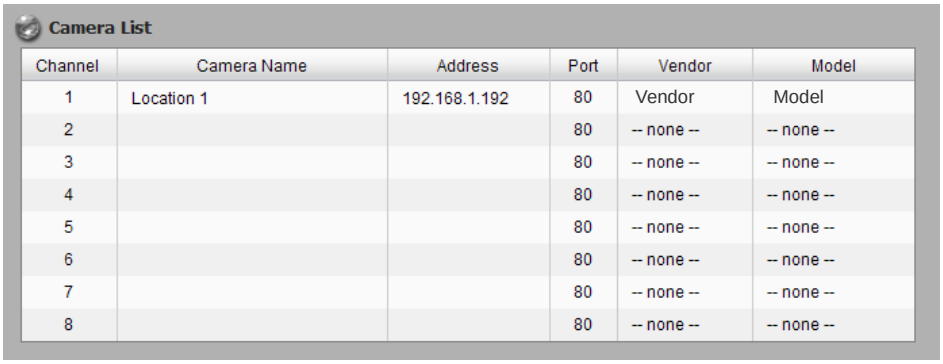
6. After clicking the ✚ icon, the camera setting page will pop up. Click the item to which you want to add a camera.
7. Insert the camera name, user name, and password.



Note

Some cameras will limit the login authority to the administrator. In this condition, you need to change the user name and password to the administrator's to log in to those cameras.

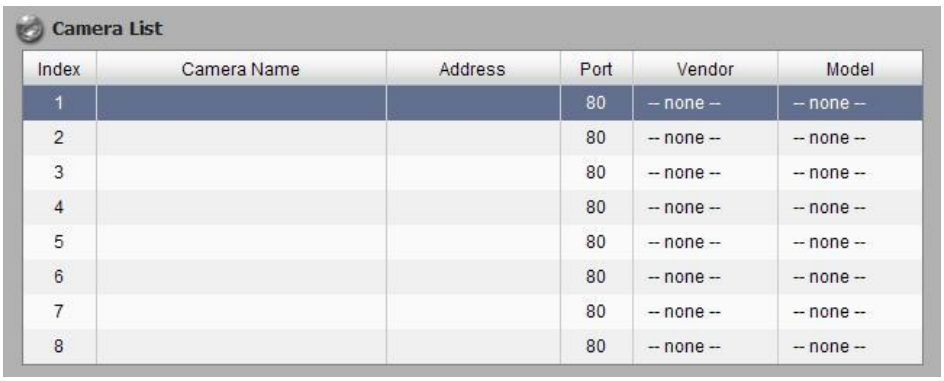
8. Click the **Add** button to add it.
9. After clicking the **Add** button, the updated camera list will be displayed in the **Camera Setting** tab.



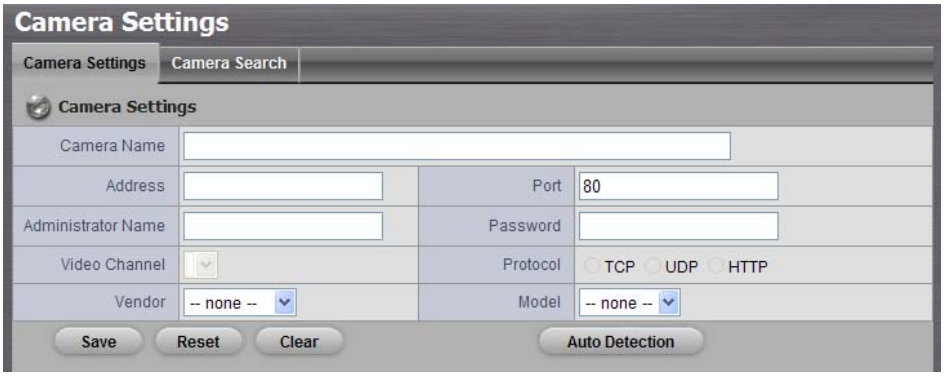
10. Repeat steps 5 through 8 to add other cameras to your list.

2.1.2 Add non-UPnP Cameras

1. Open Internet Explorer and log in to the unit.
2. Click **IP Camera** / **Camera Settings**.
3. Click the **Camera Settings** tab, and the camera list will be displayed on the bottom of the page.
4. Click the item to which you want to add a camera.



5. Enter the camera's information at the top of the page.



- **Camera name**: Name this camera.
- **Address**: The IP address.
- **Port**: The transmission port.
- **User name**: Login user name.
- **Password**: Login password.
- **Camera Channel**: Select the number of analog cameras supported by one video server from the list.
- **Protocol**: Data transmission protocol.
- **Vendor**: Camera vendor name.
- **Model**: Camera model name.

Note

Some cameras will limit the login authority to the administrator only. In this condition, you need to change the username and password to the administrator's to log in to those cameras.

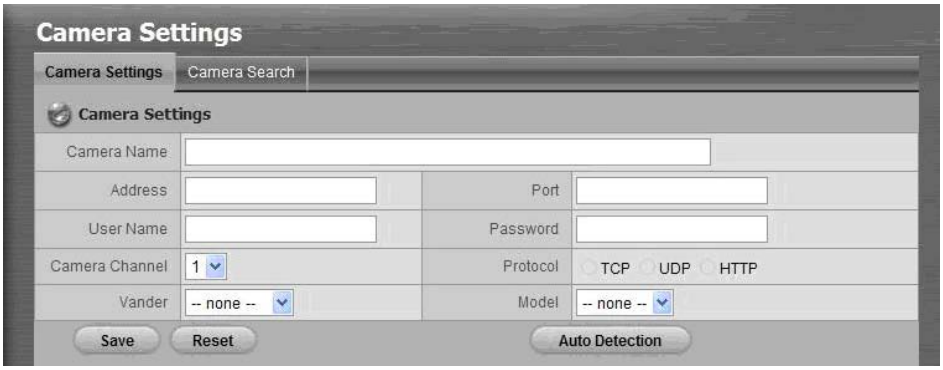
6. Click the **Save** button.

- **Save**: Save the information of this camera.
- **Reset**: Return to the latest saved settings of the selected camera.
- **Clear**: Set all the settings to default value. (Need to click the **Auto Detection** button to store this change.)
- **Auto Detection**: After inserting IP address, port, user name, and password, click this button to automatically detect all of this camera's information. (such as Camera Channel, Protocol, Vendor, and Model)

7. Repeat steps 4 through 6 to add other cameras into your list.

2.1.3 Modify Camera Information

1. Open Internet Explorer and log in to the unit.
2. Click **IP Camera** / **Camera Settings**.
3. Click the **Camera Settings** tab.
4. Click the camera which you want to modify.
5. Modify its information at the top of the page.



6. Click the **Save** button.
7. If you want to replace a camera, click that camera, modify its address, port, user name, and password, and then click the **Save** button.

2.1.4 Modify Camera Parameters

1. Open Internet Explorer and log in to the unit.
2. Click **IP Camera** / **Camera Parameters**.
3. Click the **Camera Parameter** tab.
4. Click the camera which you want to modify in the camera list.
5. Modify its information at the top of the page.
6. Click the **Save** button.

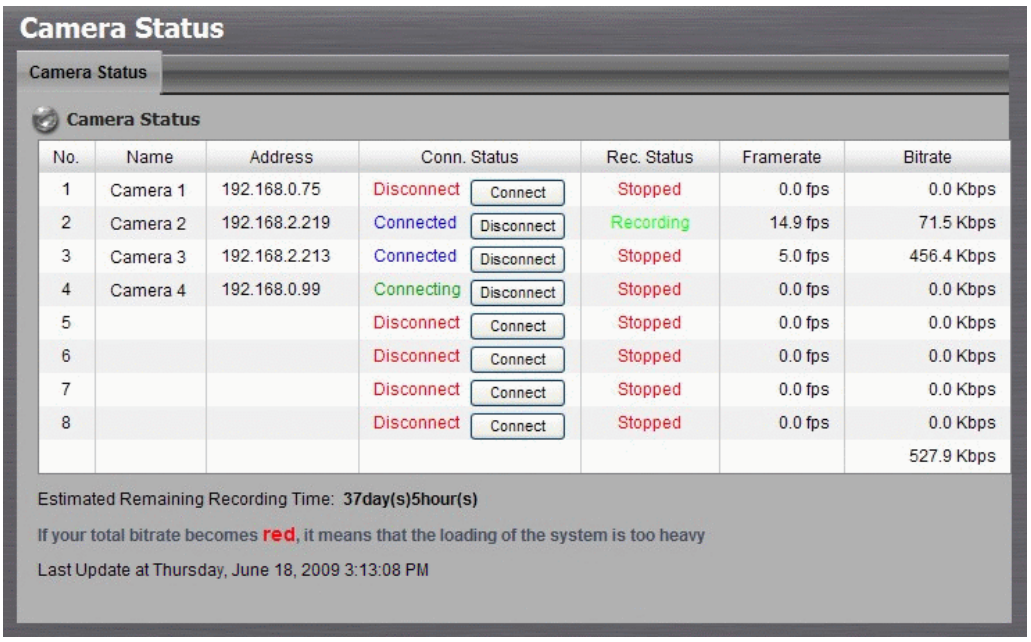
- **Camera Name**: The name of this camera.
- **Video Format**: Select the type of format which this camera supports.
- **Frame rate**: Choose the frame rate of the camera.
- **Resolution**: Choose the resolution of the camera.
- **Quality**: Choose the image quality of the camera.
- **Audio**: Check the **Enable Audio** option to view and enable audio recording.

Note

If the selected frame rate is higher than the camera's maximum frame rate, the system will automatically adjust the frame rate downward to the maximum.

2.1.5 View Camera Status

1. Open Internet Explorer and log in to the unit.
2. Click **IP Camera** / **Camera Status**.
3. Click the **Camera Status** tab.


Camera Status
Camera Status
Camera Status
No. Name Address Conn. Status Rec. Status Framerate Bitrate
1 Camera 1 192.168.0.75 Disconnect Connect Stopped 0.0 fps 0.0 Kbps
2 Camera 2 192.168.2.219 Connected Disconnect Recording 14.9 fps 71.5 Kbps
3 Camera 3 192.168.2.213 Connected Disconnect Stopped 5.0 fps 456.4 Kbps
4 Camera 4 192.168.0.99 Connecting Disconnect Stopped 0.0 fps 0.0 Kbps
5 Disconnect Connect Stopped 0.0 fps 0.0 Kbps
6 Disconnect Connect Stopped 0.0 fps 0.0 Kbps
7 Disconnect Connect Stopped 0.0 fps 0.0 Kbps
8 Disconnect Connect Stopped 0.0 fps 0.0 Kbps
527.9 Kbps
Estimated Remaining Recording Time: 37day(s)5hour(s)
If your total bitrate becomes red, it means that the loading of the system is too heavy
Last Update at Thursday, June 18, 2009 3:13:08 PM

- **Conn. Status**: The status of the connection. Click the **Connect** or **Disconnect** button to change the connection status.
- **Rec. Status**: The set recording schedule of this camera in this time.

- **Framerate**: The frame rate of this camera.
- **Bitrate**: The transmission bit rate of this camera.
- **Estimated Remaining Recording Time**: Estimated remaining recording time is dividing the current free capacity by dynamic total bitrate.

Note

If your total bitrate becomes red, it means that the loading of the system is too heavy.

2.2 Recording & Event Setup

2.2.1 Recording Mode Setup

1. Open Internet Explorer and log in to the unit.
2. Click **Recording & Event** / **Recording settings**.
3. Click the **Recording Mode** tab.
4. If selecting **Always Recording**, the chosen cameras will begin to record immediately.

- **No Recording**: Turn off the recording.
- **Recording by Schedule**: Recording by schedule.
- **Always Recording**: Permanently turn on the chosen cameras.
- **Automatic Recycle**: Check the **Enable** option to recycle disk space automatically when the disk space is full.
- **Keep Video**: Set a period during which the recorded video clips will be kept intact.

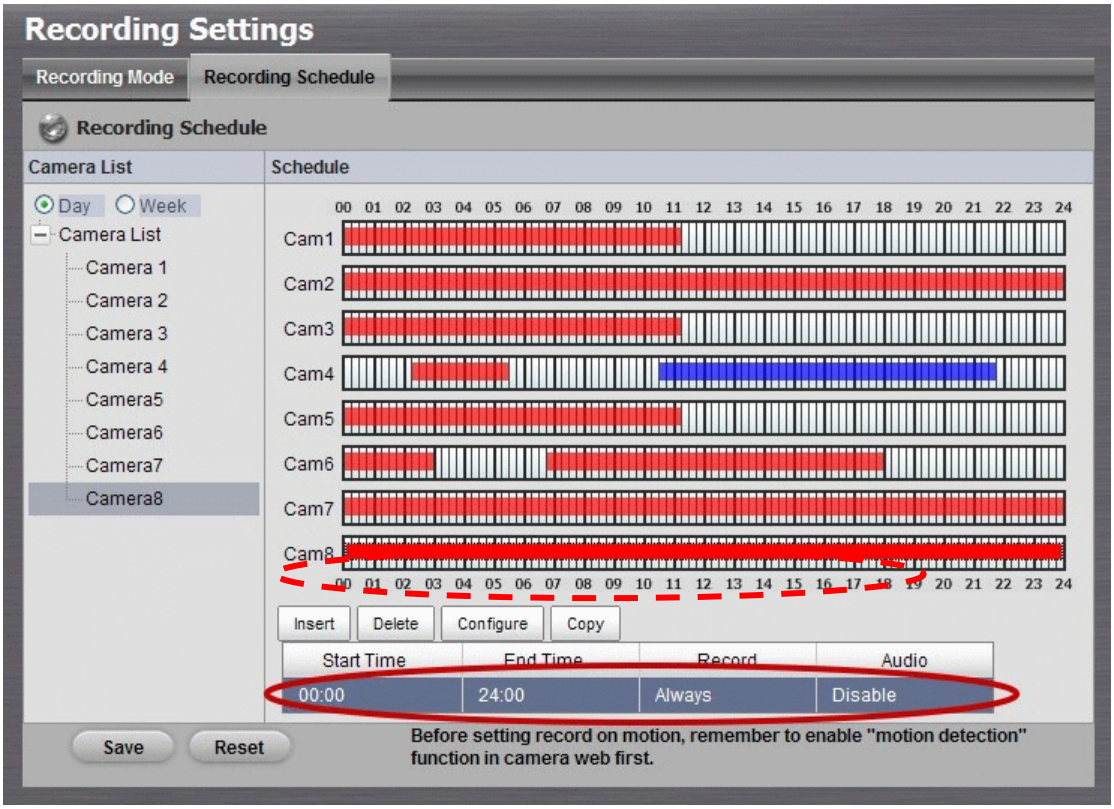
2.2.2 Recording Schedule / Event Setup

Instead of **Always Recording**, you can begin the recording by setting the **Recording Schedule**.

1. Open Internet Explorer and log in to the unit.
2. Click **Recording & Event** / **Recording Settings**.
3. Click the **Recording Schedule** tab.
4. Check the **Day** or **Week** mode.

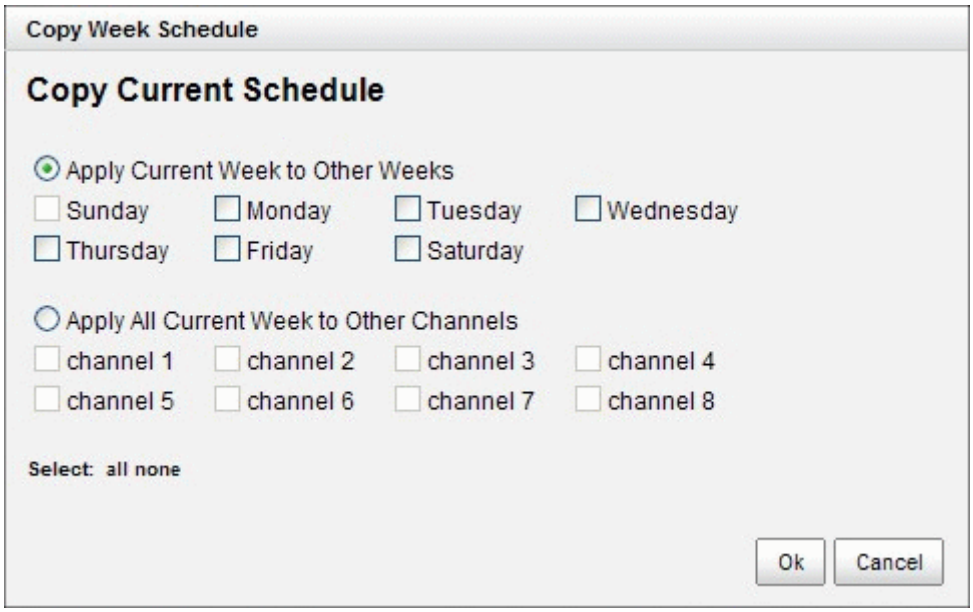
- **Day**: Schedule the cameras to turn the recorder on and off at the same time every day according to your setting.
- **Week**: Schedule the cameras for each day of the week differently.

5. Click the schedule of the camera which needs to be modified.
6. Click the column on the bottom of the page.

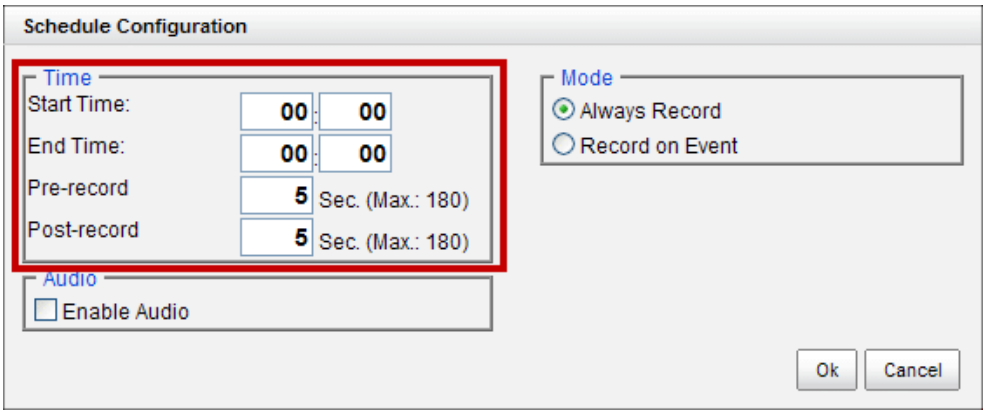


- **Insert**: Insert new schedules.
- **Delete**: Delete the selected schedule.
- **Configure**: Modify the schedule and recording mode settings.

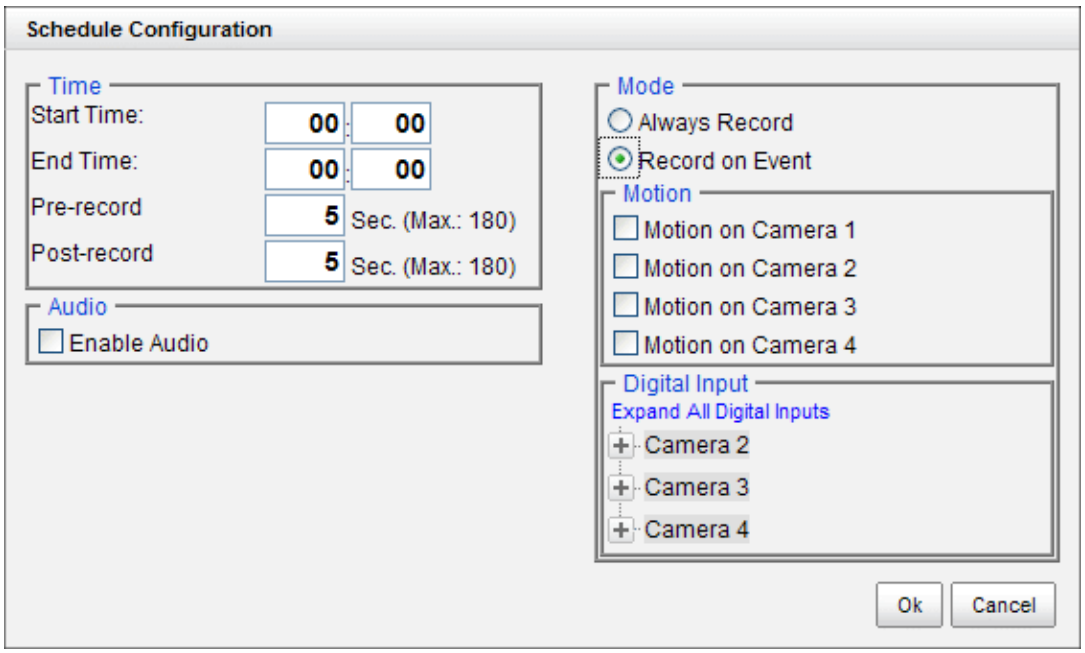
- **Copy**: Copy current **Day Schedule** to other channel(s); copy current **Week Schedule** to other day(s) of a week or to other channel(s).



7. The default setting of the camera's recording schedule is from 00:00 to 24:00. If you want to modify the time slot, click the **Configure** button to modify the default settings first.



8. Choose the recording mode.

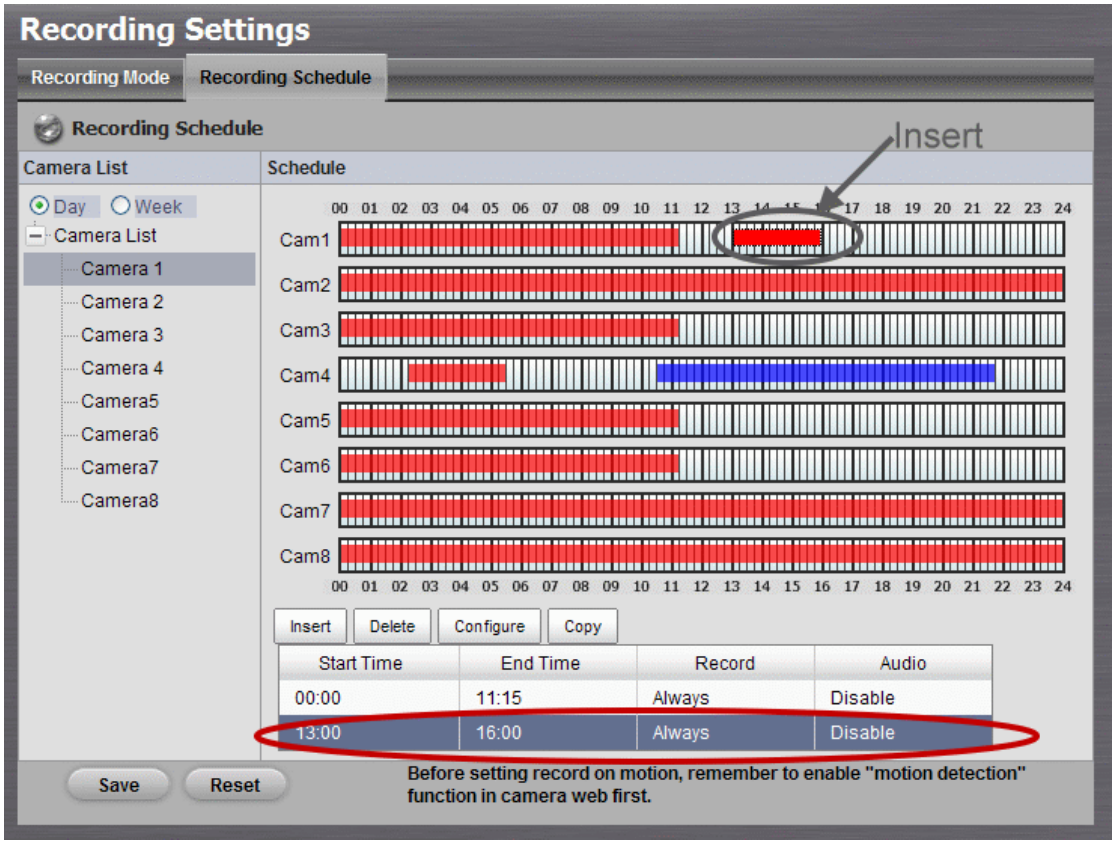


- **Always Record**: Always record.
- **Record on Event**: Record when events triggered. The event can be triggered by ***Motion*** or ***Digital input***.

Note

When setting the event ***Motion***, please first ensure that the motion detection function in your camera has been enabled.

9. If you want to add another new schedule, click the **Insert** button to add a new one.



10. Repeat step 9 to add other new schedules.
11. Repeat steps 5 through 9 to set other cameras.
12. Click the **Save** button.

Note

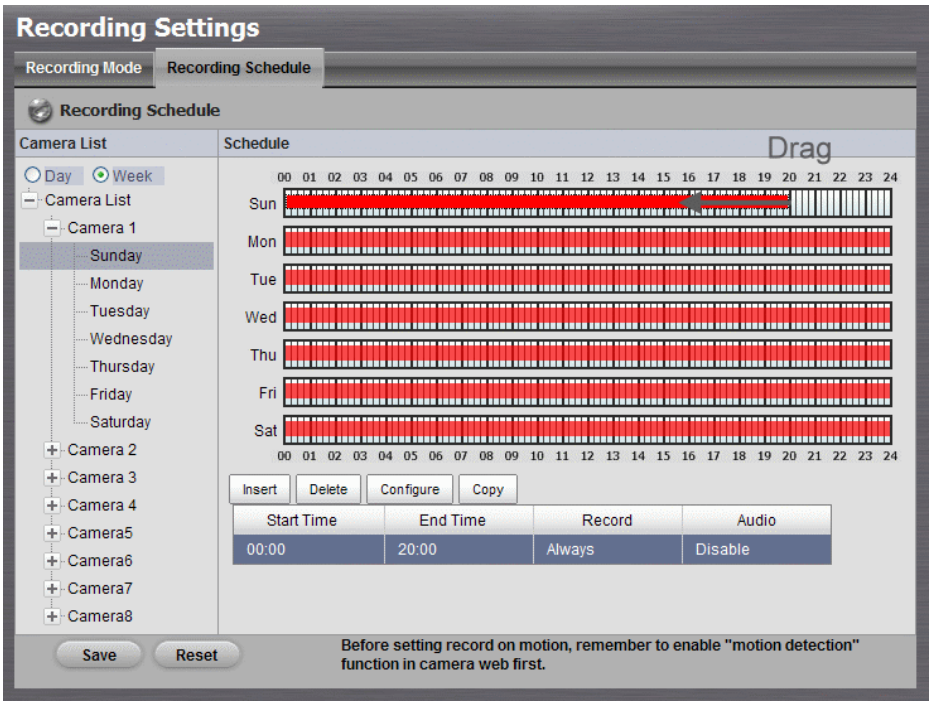
When changing the motion detection settings of a camera, make sure to disconnect your unit and that camera first. Once you have finished, re-connecting them will update the settings in your unit.

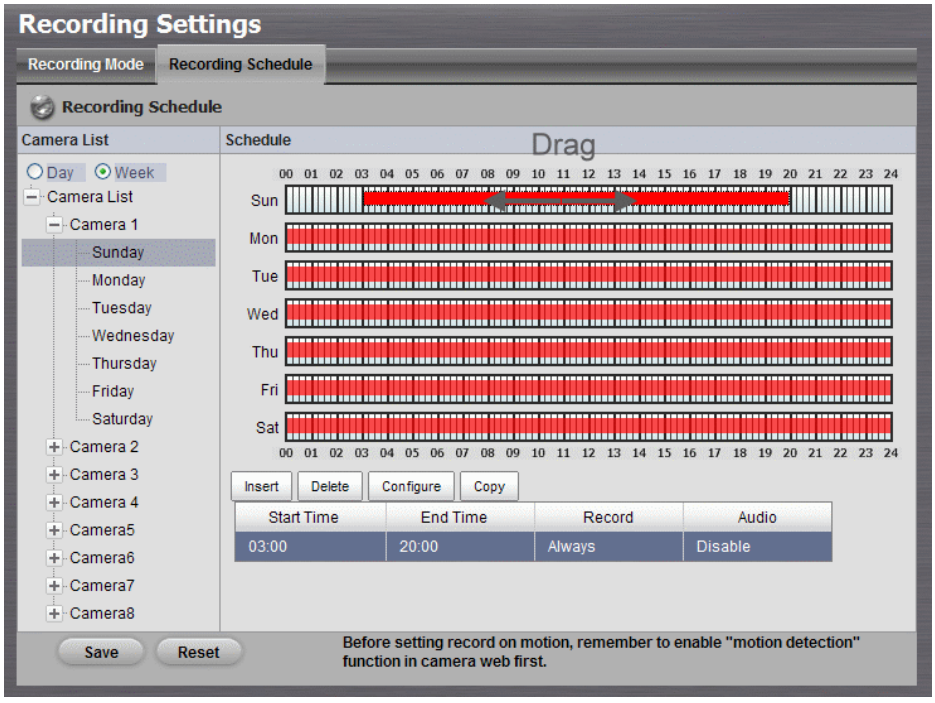
Note

When setting an event, ***Motion*** or ***Digital input*** can be triggered from other cameras. This means that if the system detects motion or digital input from other cameras, the camera will begin recording.

Note

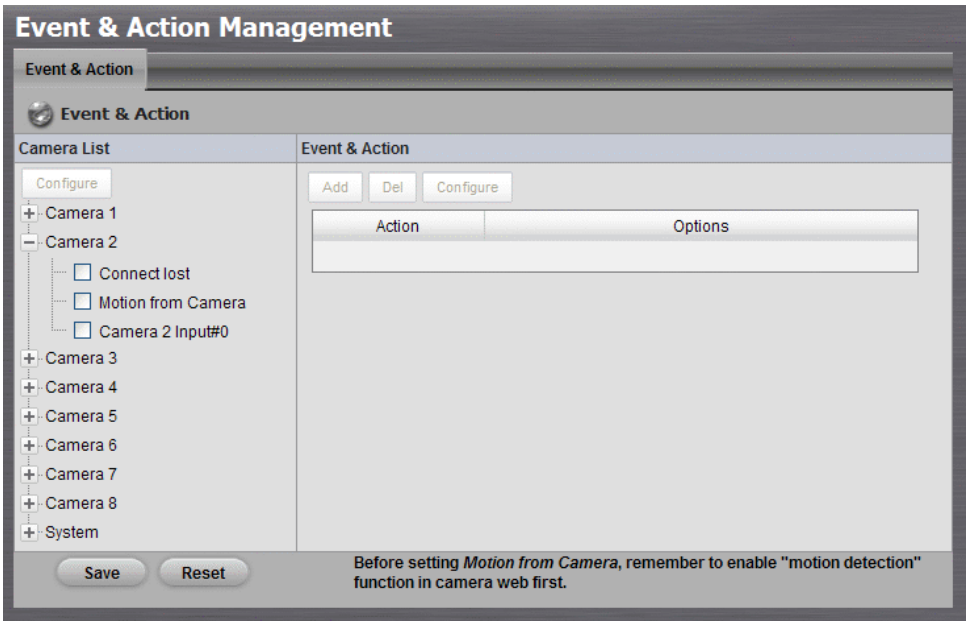
There is another way to set the schedule. If you want to change the recording time length, drag the end of the time bar from 24:00 back to the length you wish, and then drag the beginning of the time bar to the point at which you would like it to commence recording. (You may also click the **Insert** button to add new schedules.)





2.2.3 Camera Events and Responding Actions Setup

1. Open Internet Explorer and log in to the unit.
2. Click **Recording & Event** / **Event & Action Management**.
3. Click the **Event & Action** tab.
4. Choose the camera, and then select one of the three events.

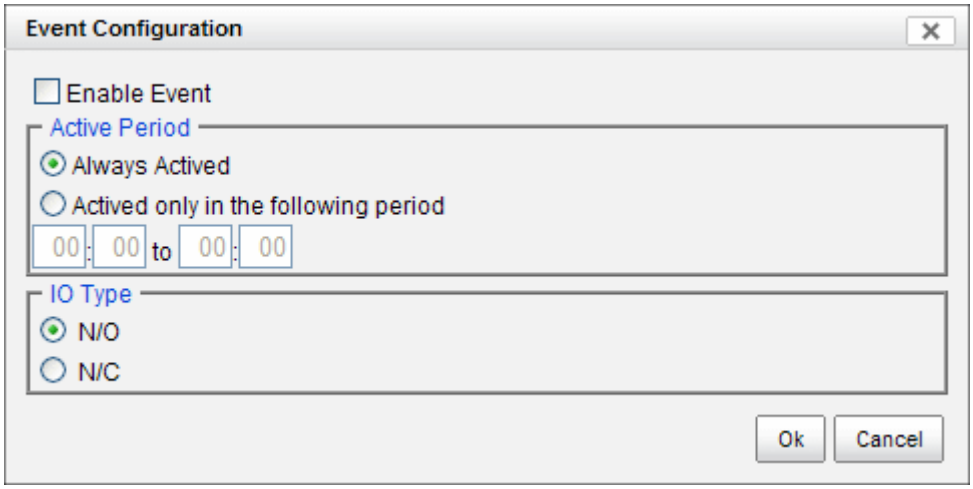


- **Connect lost**: When a connection between the camera and this unit is lost, the system will trigger an action.
- **Motion from Camera**: When video motion is detected, the camera triggers an action.
- **Input**: Any external input can trigger an action.

Note

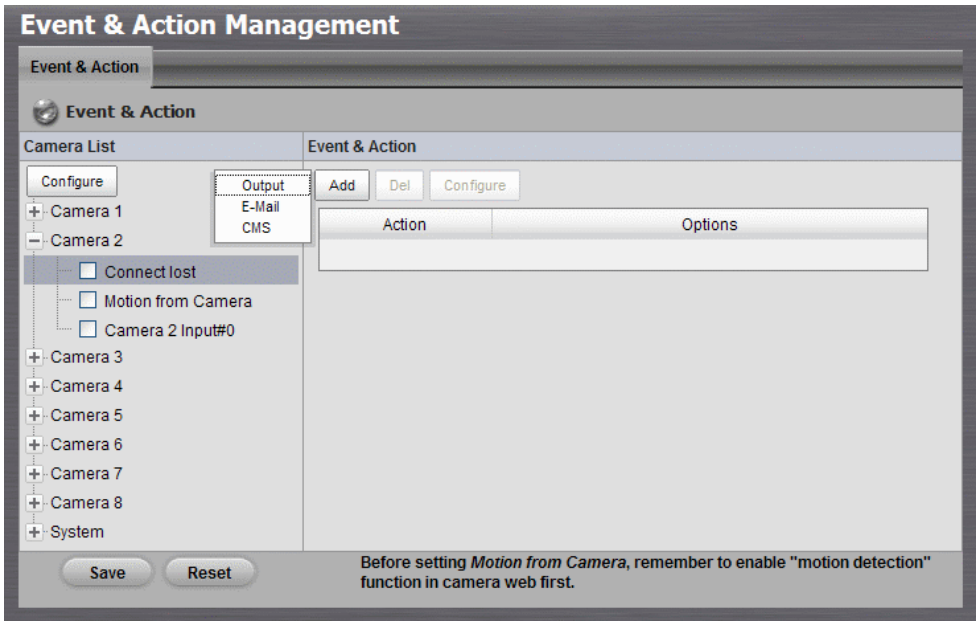
When setting the event ***Motion from Camera***, make sure to set up the camera's motion detection function first. Besides, event log will be recorded only if event is selected on this page.

5. Click the **Configure** button to enable the event and select the active period.



- **Always Actived**: The selected event is always active.
- **Actived only in the following period**: The selected event is only active in the designated time, which able to cover two days e.g. from 18:00 to 09:00.
- **I/O Type**: Check one of the options of I/O type. N/O means normal open, while N/C means normal close.

6. Click the **Add** button to set up the responding actions of this event.



- **Output**: When an event occurs, the system will send out an output signal to other connected devices.
- **E-Mail**: When an event occurs, the system will send e-mail notifications. Make sure to add an e-mail address first.

- **CMS**: When an event occurs, the system will send out a signal to CMS. CMS will highlight this event.

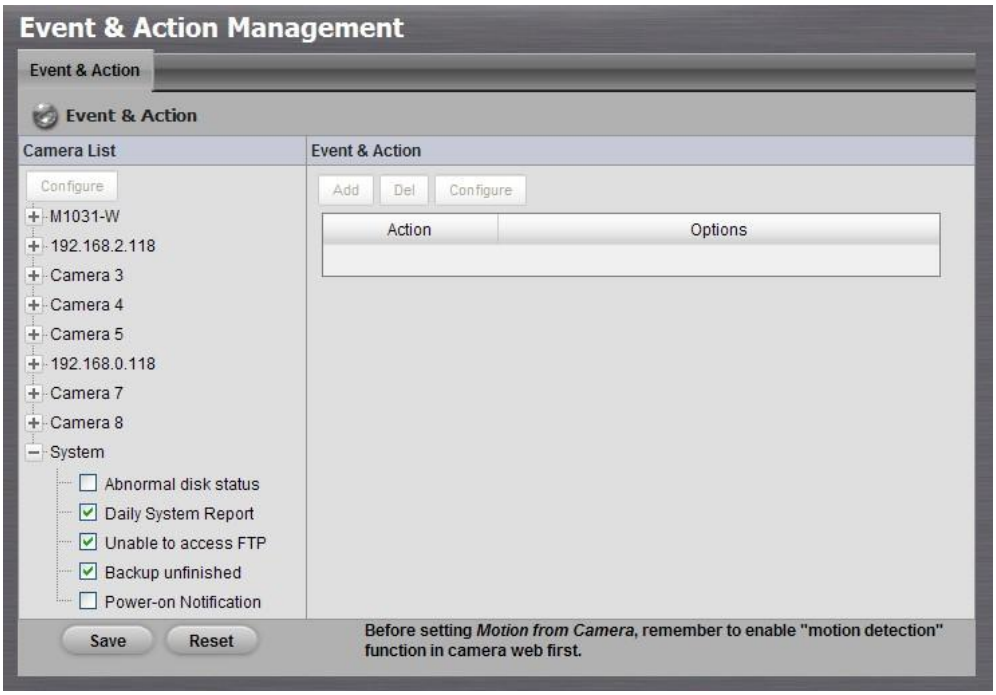
7. Click the action, and then click the **Configure** button to modify the details of that action if necessary.
8. Repeat steps 4 and 5 to add more actions.
9. Repeat steps 3 through 5 to set up more cameras.
10. Click the **Save** button.

Note

The screen will display the event information when triggered after selecting any one of them (Connection lost, Motion on the edge, Digital input).

2.2.4 System Events and Responding Actions Setup

1. Open Internet Explorer and log in to the unit.
2. Click **Recording & Event** / **Event & Action Management**.
3. Click the **Event & Action** tab.
4. Click **System** to unfold the list of system events, and then select one of the five events.

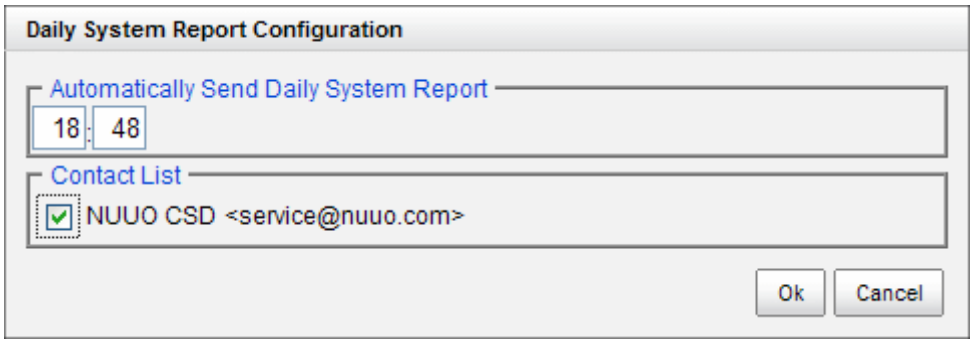


- **Abnormal disk status**: When there is no enough disk space for recording or when disk is abnormal for accessing, the system will trigger an action.
- **Daily System Report**: Enable users to know the system information, HDD usage, and Disk status everyday through E-mail without accessing to the unit to check.
- **Unable to access FTP**: The action will be triggered when the connection between the unit and FTP server is lost.
- **Backup unfinished**: If there is any file which the system didn't complete the backup process, the file(s) name will be listed and send out through E-mail after finishing the last file of this backup schedule.
- **Power-on Notification**: Record the time as power was turning on.

5. Click the **Add** button to set up the responding actions of this event. Follow the steps in the previous section.
6. Click the **Save** button.

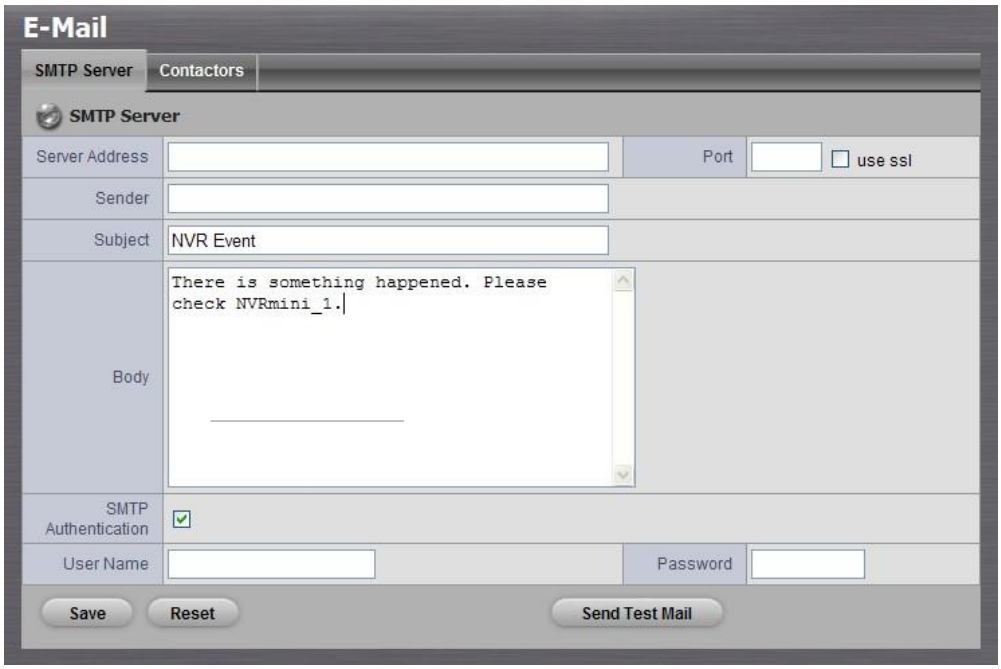
Note

E-Mail is the only one action to the event **Daily System Report**, **Unable to access FTP**, **Backup unfinished** and **Power-on Notification**. In addition to select a contactor, remember to insert the time of sending daily system report.



2.2.5 SMTP Server Setup

1. Open Internet Explorer and log in to the unit.
2. Click **Recording & Event** / **E-Mail**.
3. Click the **SMTP Server** tab.

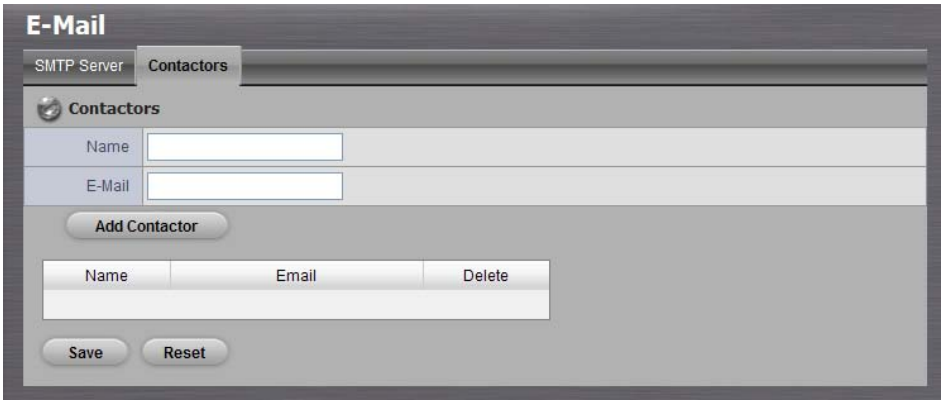


- **Server Address**: SMTP (Simple Mail Transport Protocol) server IP address.
- **Port**: SMTP port.
- **Sender**: Sender information.
- **Subject**: Subject.
- **Body**: E-Mail content.
- **SMTP Authentication**: Before sending out an E-Mail, enter the user name and password for SMTP authentication.
- **User Name**: User name.
- **Password**: Password.

4. Click the **Send Test Mail** button and the system will send a test mail to the sender. Check it after testing.
5. Click the **Save** button.

2.2.6 Add Event Contacts

1. Open Internet Explorer and log in to the unit.
2. Click **Recording & Event** / **E-Mail**.
3. Click the **Contactors** tab.



- **Add Contactor**: Add this new contact into the contact list.
- **Reset**: Return to the latest saved settings of the contact list.
- **Save**: Save this time modification of the contact list.

4. Insert the name of a new contact.
5. Insert the e-mail address of this new contact.
6. Click the **Add Contactor** button.
7. Click the **Save** button to save this modification of the contact list.

2.3 RAID & File Settings

2.3.1 View RAID Volume Status

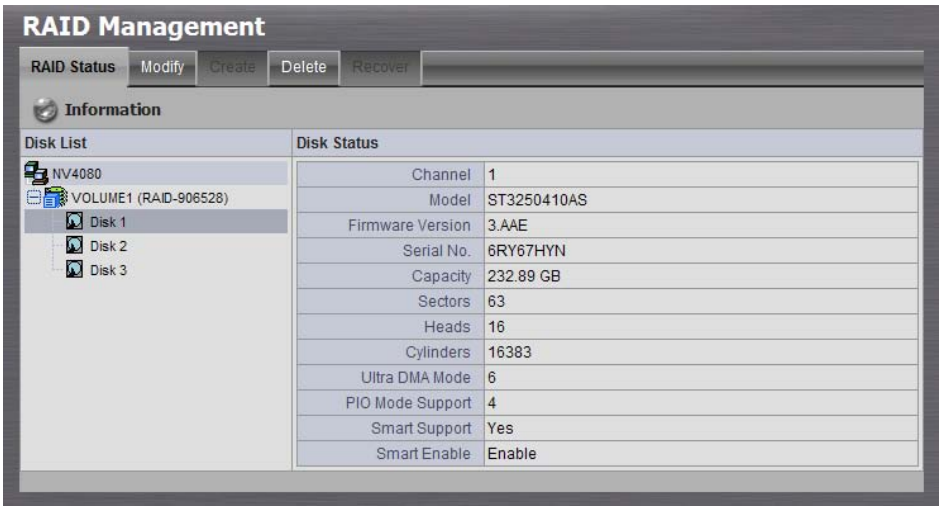
RAID status refers to the disk drives on your unit and how they are arranged into a RAID Volume.

1. Open Internet Explorer and log in to the unit.
2. Click **RAID & File System** / **RAID Management**.
3. Click the **RAID Status** tab to view the status of your RAID Volume.

- **RAID Name**: Name of your RAID, automatically assigned when it was created.
- **RAID Level**: RAID 0, 1, 5, or 10, specified when it was created.
- **Capacity**: data capacity of the RAID Volume in GB.
- **RAID Status**: ***Functional*** is normal. ***Critical*** means one disk drive has failed. ***Offline*** means you cannot access your data.
- **Action Status**: ***Idle*** is normal. ***Rebuilding*** means the RAID Volume is being rebuilt after a disk drive failure. ***Migrating*** means the RAID Volume is adding a disk drive or changing RAID levels.
- **Background Activity**: ***None*** is normal. ***Running*** means a background activity is in progress.

2.3.2 View Disk Drive Information

1. Open Internet Explorer and log in to the unit.
2. Click **RAID & File System** / **RAID Management**.
3. Click the **RAID Status** tab.
4. Click a disk icon to view the disk drive information.

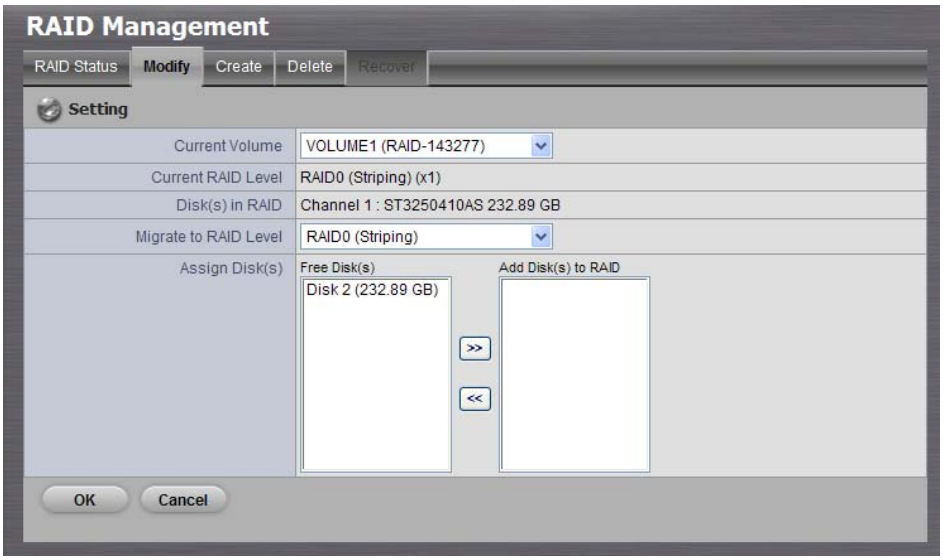


2.3.3 Migrate a RAID Volume

To migrate a RAID Volume means to change its RAID level or to add disk drives.

1. Open Internet Explorer and log in to the unit.
2. Click **RAID & File System** / **RAID Management**.

3. Click the **Modify** tab.



4. From the Current Volume drop-down menu, choose the RAID Volume which needs to be modified.
5. In the Migrate to RAID Level drop-down menu, choose the target RAID Level.
6. To add disk drives, highlight disk drives in the **Free Disks** column and click the **>>** button to move them to the Disks in RAID column.
7. Click the **OK** button to finish it.

With those steps, the RAID Volume is modified as you directed. Migration requires several minutes, depending on the type of modification taking place and the size of your disk drives.

During the modification, your RAID Volume and all of the folders on it are fully accessible.

After the migration is completed, you must extend the file system so as to use the storage space you have added. You can extend the file system immediately or wait until later.

8. Click the **RAID & File System** / **File System Management**.
9. Click the **Extend File System** button.

2.3.4 Create a RAID Volume

In this system, the term RAID Volume refers to one or more disk drives working together as a RAID logical drive. You must have unassigned disk drives in your unit to create a new RAID.

1. Open Internet Explorer and log in to the unit.
2. Click **RAID & File System** / **RAID Management**.
3. Click the **Create** tab.

4. From the RAID Level drop-down menu, choose the RAID level you prefer for your disk array.
5. Highlight disk drives in the Free Disks column, then click the **>>** button to move them to the Disks in RAID column.
6. Click the **OK** button.

The RAID Volume is created and formatting begins. Formatting requires several minutes, depending on the size of your disk drives.

Important

After setting the RAID level and disks, we recommend not changing the number of disks. Changing the number of disks requires a re-creation of the RAID level, which will destroy all of your data.

Important

To reduce the possibility of having problem to access public folder in the unit, before creating new disk volume or modifying volume, please delete the invalid volume if any.

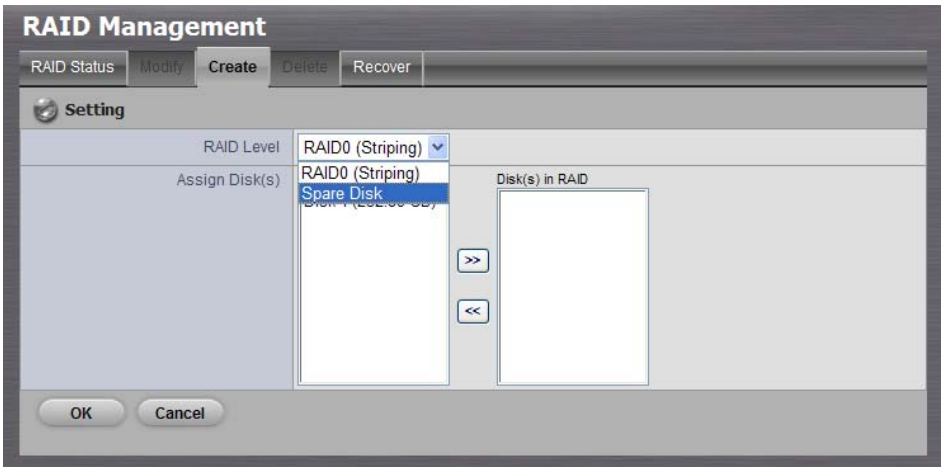
Note

If you use Express Mode when using the **Install Wizard**, the disk(s) will be set to RAID 1 (2 bay) or RAID 5 (4 bay) automatically. If you use Advance Mode when using the **Install Wizard**, the disk(s) will become the RAID level you set.

2.3.5 Designate a Spare Drive

If you have an unassigned disk drive, you can assign it as a spare drive.

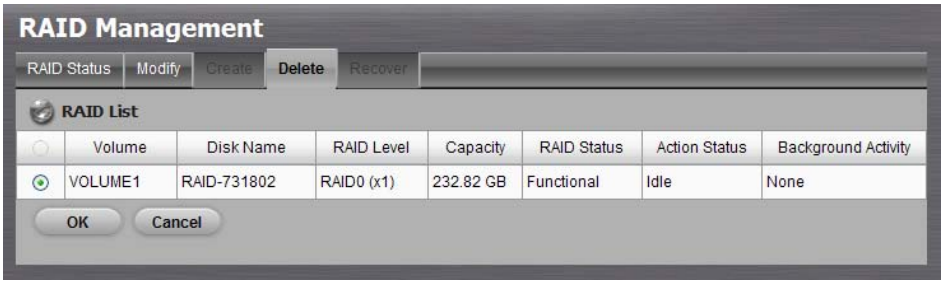
1. Insert the unassigned disk drive.
2. Open Internet Explorer and log in to the unit.
3. Click **RAID & File System** / **RAID Management**.
4. Click the **Create** tab.
5. From the RAID Level drop-down menu, choose Spare Disk.



6. Highlight a disk drive in the Free Disks column and click the **>>** button to move it to the Disks in RAID column.
7. Click the **OK** button.

2.3.6 Delete a RAID Volume

1. Open Internet Explorer and log in to the unit.
2. Click **RAID & File System** / **RAID Management**.
3. Click the **Delete** tab.



4. Click the option button beside the RAID Volume you want to delete.
5. Click the **OK** button.
6. In the confirmation box, type “YES” into the field provided, and then click the **OK** button.
7. After a RAID Volume is deleted, you need to reboot the unit.

Caution

When you delete a RAID Volume, you delete all the folders in the RAID volume and all the data saved in the folders. Backup any important data before deleting a RAID Volume.

Note

You cannot delete a RAID Volume while a background activity is running, such as Migration or Rebuild. Wait until these activities are completed.

2.3.7 Recover

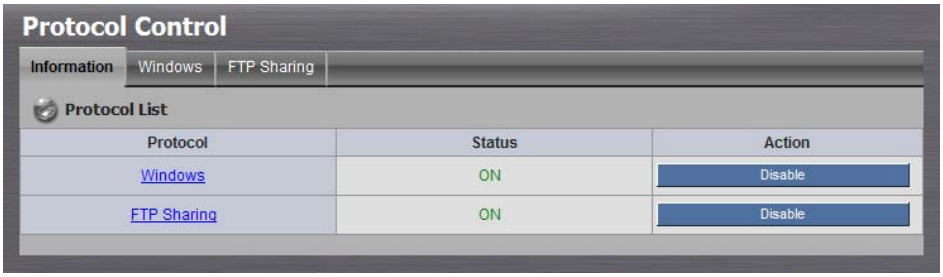
For the purpose and usage of recover, you can refer to **10.6 Respond to an Invalid RAID Volume**.

2.3.8 View Protocol Status

There are another two ways to access the recorded data in the unit: through Workgroup or through FTP. Follow the following steps to view the

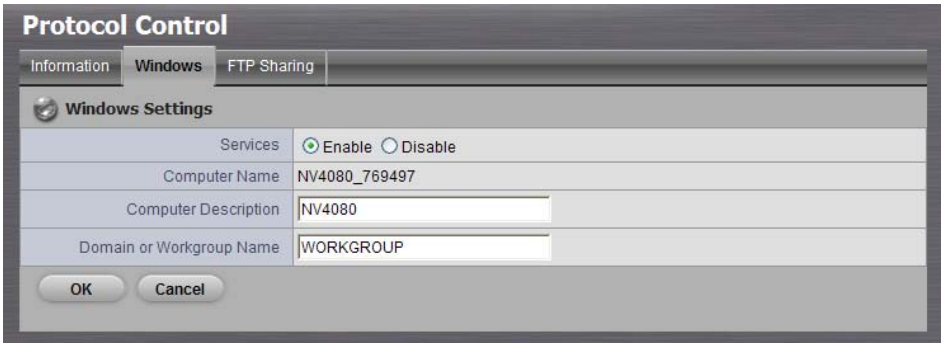
status of these two ways.

1. Open Internet Explorer and log in to the unit.
2. Click **RAID & File System** / **Protocol Control**.
3. Click the **Information** tab.



2.3.9 Modify the "My Network Places" Protocol Settings

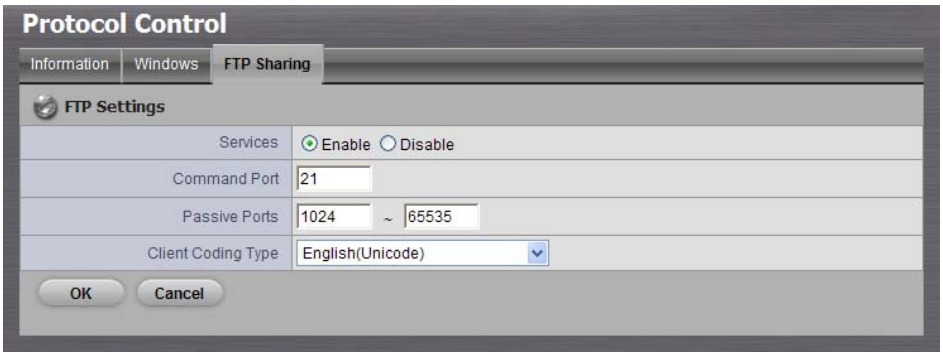
1. Open Internet Explorer and log in to the unit.
2. Click **RAID & File System** / **Protocol Control**.
3. Click the **Windows** tab.
4. Check and enter the unit's information.
5. Click the **OK** button.



- **Services**: Whether users can access this unit through Windows Explorer or not.
- **Computer Name**: The name of this unit, which is set in the **Setup** tab in the **Network Setup** function.
- **Computer Description**: The name which will be displayed in Windows Explorer.
- **Domain or Workgroup Name**: The name of this unit's workgroup.

2.3.10 Modify the FTP Protocol Settings

1. Open Internet Explorer and log in to the unit.
2. Click **RAID & File System** / **Protocol Control**.
3. Click the **FTP Sharing** tab.
4. Check and enter the settings of this unit.
5. Click the **OK** button.



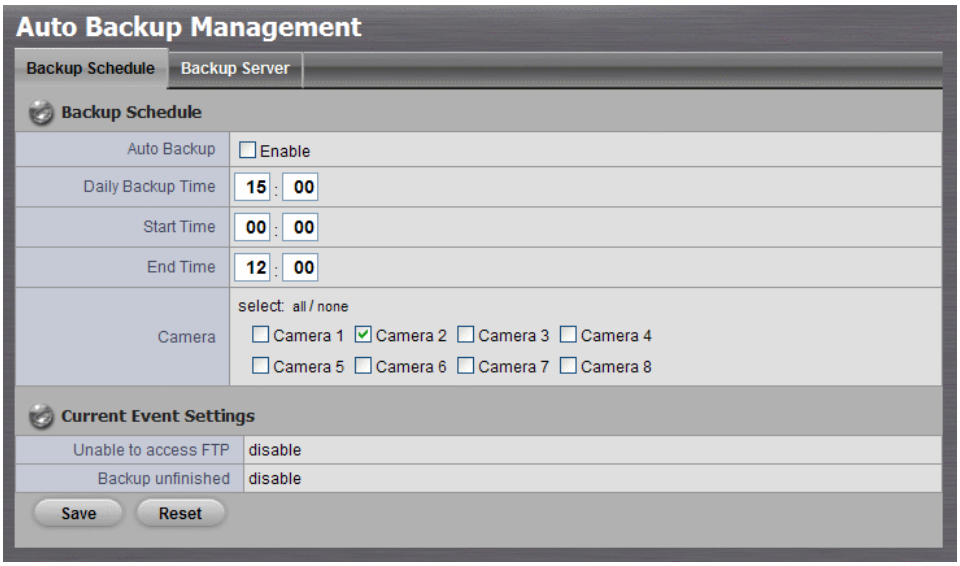
- **Services**: Whether users can access this unit through FTP or not.
- **Command Port**: The port for commands between a server and a client.
- **Passive Ports**: The data transmission port of passive mode.
- **Client Coding Type**: If your FTP client uses double-byte characters but does not support Unicode, choose your FTP client's encoding from the Client Coding Type drop-down menu.

2.4 Auto Backup

This feature enables you to automatically backup the recorded video of the previous date to FTP site. There are two steps to enable the function, one is **Set up Backup Schedule**, another is **Set up Backup Server**.

2.4.1 Set up Backup Schedule

1. Open Internet Explorer and log in to the unit.
2. Click **RAID & File System** / **Auto Backup Management**.
3. Click the **Backup Schedule** tab.
4. Set up backup schedule, select the backup channels, and check the **Enable** option to enable **Auto Backup**.



- **Auto Backup**: Check the **Enable** option to enable this function.
- **Daily Backup Time**: The daily scheduled time to start backup process.
- **Start Time**: The start time of recorded video of the previous date.
- **End Time**: The end time of recorded video of the previous date.
- **Camera**: Select the channel(s) to backup.

5. **Current Event Settings** shows the condition of the events of auto backup – enable or disable. Follow the steps of **2.2.4 System Events and Responding Actions Setup** to configure the event & action.

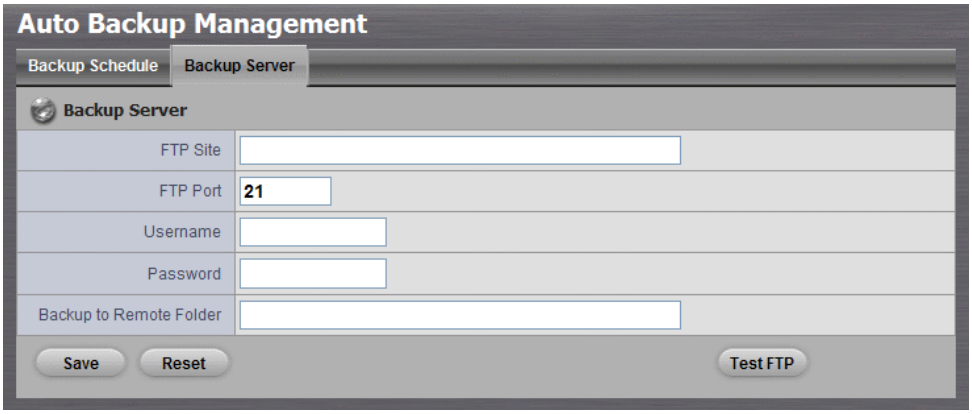
Note

The system backups recorded video files one by one. If the connection between the unit and FTP server is normal, but some problems of FTP causes the system unable to write files on FTP, the system would try each file three times before starting to backup the next file. If the connection is lost, the system would wait for the connection, so no file would be skipped.

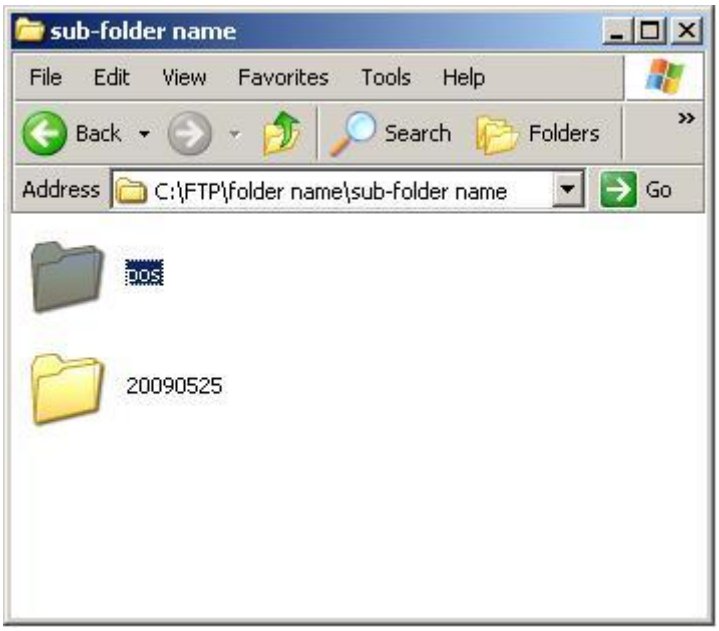
2.4.2 Set up Backup Server

1. Open Internet Explorer and log in to the unit.
2. Click **RAID & File System** / **Auto Backup Management**.
3. Click the **Backup Server** tab.

4. Set up the FTP server and create a folder for backup files. The folder format is “folder name”, “folder name\sub-folder name”, and so on.



5. After setting up all the information, click the **Test FTP** button and the system will create a folder to FTP. Check it after testing.



6. Click the **Save** button.

Note

Make sure the FTP account with privileges of administrator who is able to upload, rewrite, delete files, and create new folder. Besides, make sure the FTP server has enough space for auto backup.

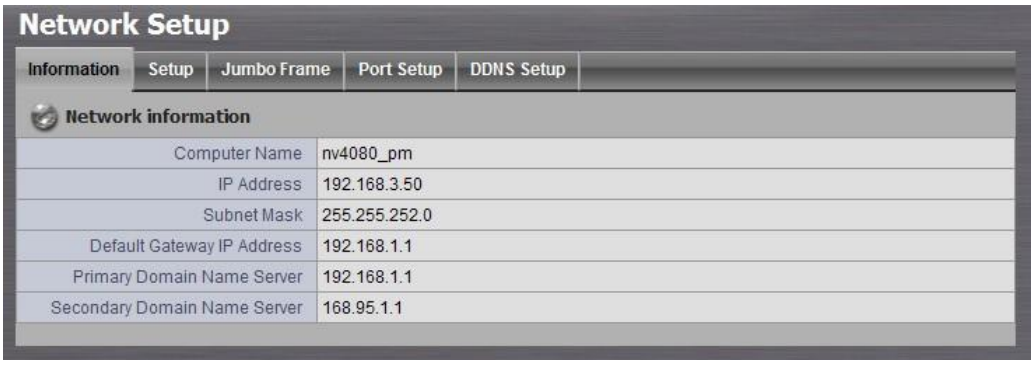
Note

To avoid the failure of auto backup, please check the normality of FTP server regularly (e.g., enough space for video, system conditions.).

2.5 Network Setup

2.5.1 View Network Status

1. Open Internet Explorer and log in to the unit.
2. Click **Network Setup** / **Network Setup**.
3. Click the **Information** tab to display the unit's network information.



2.5.2 Network Settings

1. Open Internet Explorer and log in to the unit.
2. Click **Network Setup** / **Network Setup**.
3. Click the **Setup** tab to set up the network settings of your unit.

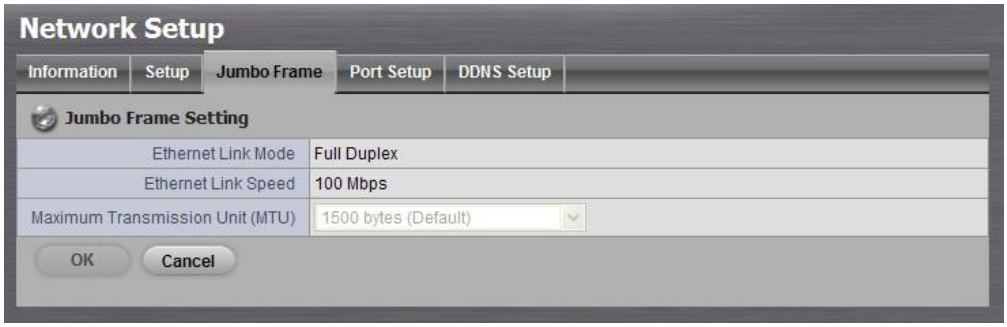
- **Computer Name**: Name your unit.

Note

Because of the internal data modifications required, it will take a few minutes to change the name of your unit. During this period, it will not be possible for you to access your unit. There is no need to restart the unit; simply wait until it is possible to re-access.

- **Ethernet Link Speed**: Select the LAN transmission speed you prefer. (4 bay)
- **Internet Protocol**: Check whether you want to apply a specific internet protocol to your unit.
- **IP Address**: IP address of this unit.
- **Subnet Mask**: Subnet mask address.
- **Default Gateway IP Address**: Gateway IP address.
- **Primary DNS**: Primary DNS (Domain Name System) address.
- **Secondary DNS**: Secondary DNS address.

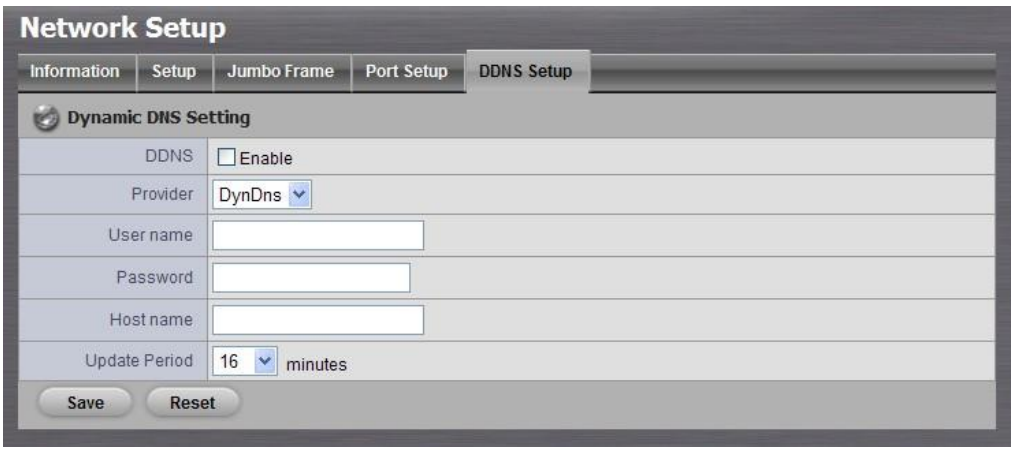
4. Click the **Jumbo Frame** tab to use the unit's maximum transmission settings.



- **Ethernet Link Mode**: Full duplex or half duplex transmission.
- **Ethernet Link Speed**: Transmission speed.
- **Maximum Transmission Unit**: Limit the maximum transmission size. If the transmission package is larger than this setting, the system will divide it into smaller packages when transmitting.

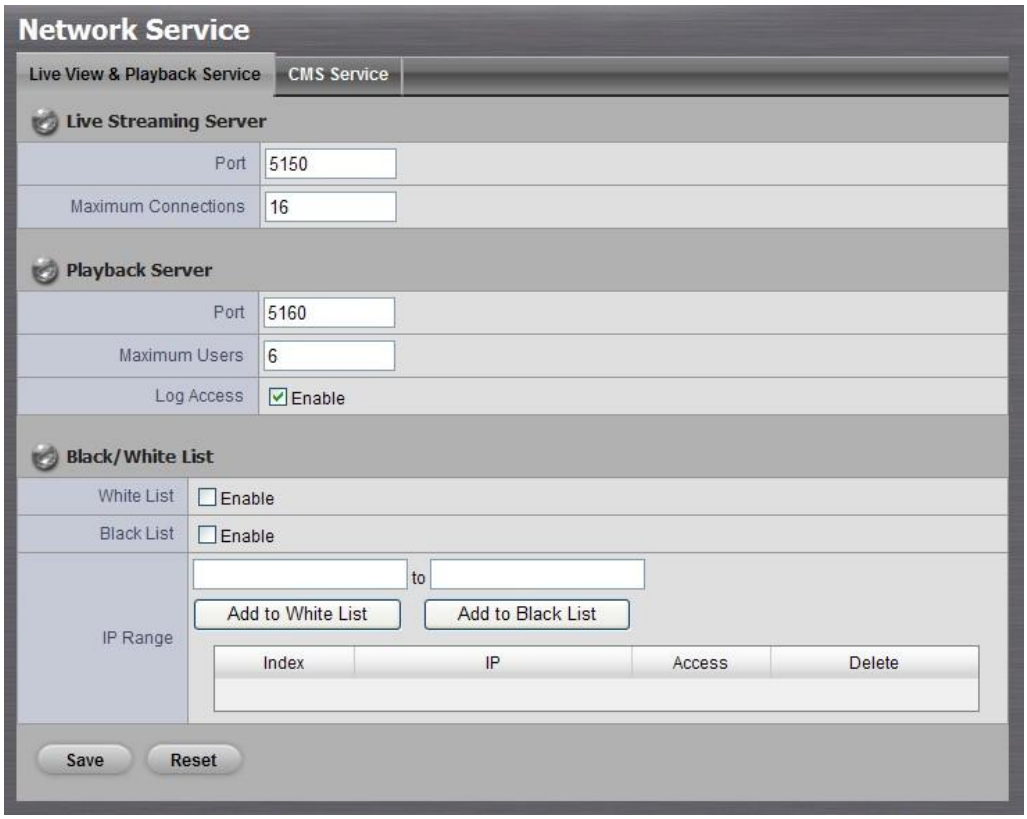
5. Click the **Port Setup** tab to set the port of your unit.

6. Click the **DDNS Setup** tab to enable Dynamic Domain Name Server function, allowing you to connect unit with dynamic IP address.



2.5.3 Network Service Setup

1. Open Internet Explorer and log in to the unit.
2. Click **Network Setup** / **Network Service**.
3. Click the **Live View & Playback Service** tab.



- **Live Streaming Server**
  - Port: Live streaming transmission port.
  - Maximum Connections: Maximum connections from remote access.
- **Playback Server**
  - Port: Playback transmission port.
  - Maximum Users: The number of users who can access playback functions at the same time.
  - Log Access: Check to record playback access information on NVR Log page, including access time, playback video channels, and time frame.
- **Allowed/ Blocked List**
  - Allowed List: Only IP addresses from the allowed list are allowed to log in.

- Blocked List: IP addresses from the blocked list will be unable to log in.

Note

When setting Maximum Connections in Live Streaming Server settings, 1 connection means that only 1 user can connect to only 1 camera. If the maximum connections value is set to 16, and each user connects to 4 cameras, the allowed connections per user will become 4, rather than 16.

2.5.4 CMS Service Setup

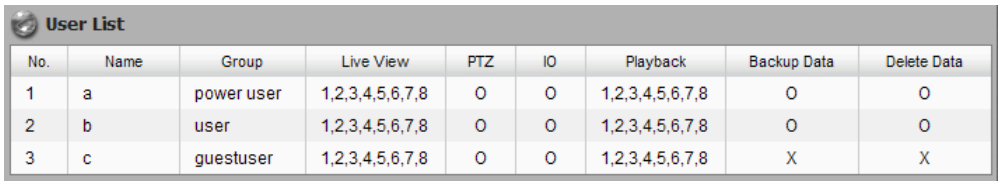
1. Open Internet Explorer and log in to the unit.
2. Click **Network Setup** / **Network Service**.
3. Click the **CMS Service** tab.

- CMS Server: Check the **Enable** option to enable CMS service.
- Port: the port number through which the CMS connects to this unit.
- Maximum Connections: The maximum number of allowed CMS connections.

2.6 Management

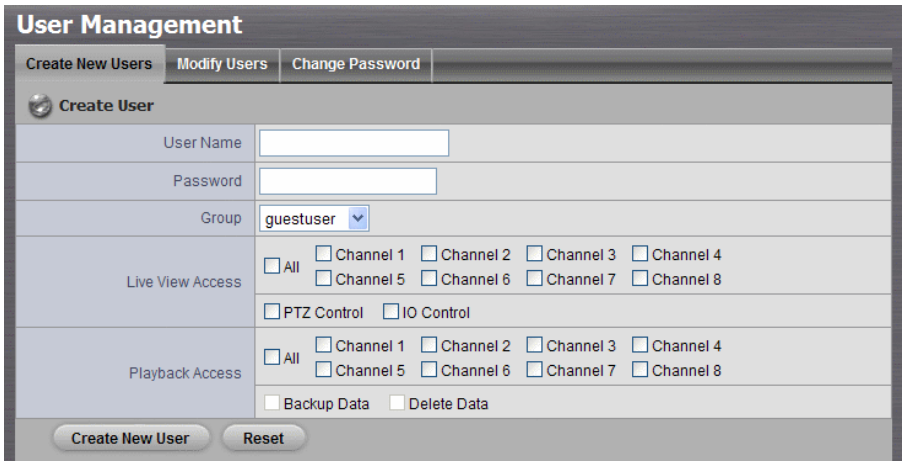
2.6.1 View the List of Users

1. Open Internet Explorer and login the unit.
2. Click **Management/ User Management**.
3. Click the **Create New Users** tab.
4. The list will be displayed on the bottom of the page.


User List
No. Name Group Live View PTZ IO Playback Backup Data Delete Data
1 a power user 1,2,3,4,5,6,7,8 O O 1,2,3,4,5,6,7,8 O O
2 b user 1,2,3,4,5,6,7,8 O O 1,2,3,4,5,6,7,8 O O
3 c guestuser 1,2,3,4,5,6,7,8 O O 1,2,3,4,5,6,7,8 X X

2.6.2 Create New Users

1. Open Internet Explorer and login the unit.
2. Click **Management/ User Management**.
3. Click the **Create New Users** tab.



4. Insert the user name of this new user.
5. Insert the password of this new user.
6. Choose the group of this user.

- **Power user**: Power user can do all the settings except the ***Network Settings***, ***RAID Settings***, and ***Management function***.
- **User**: User just can change his/her password and do the live view and playback functions.
- **Guest user**: User can do live view and playback function only.

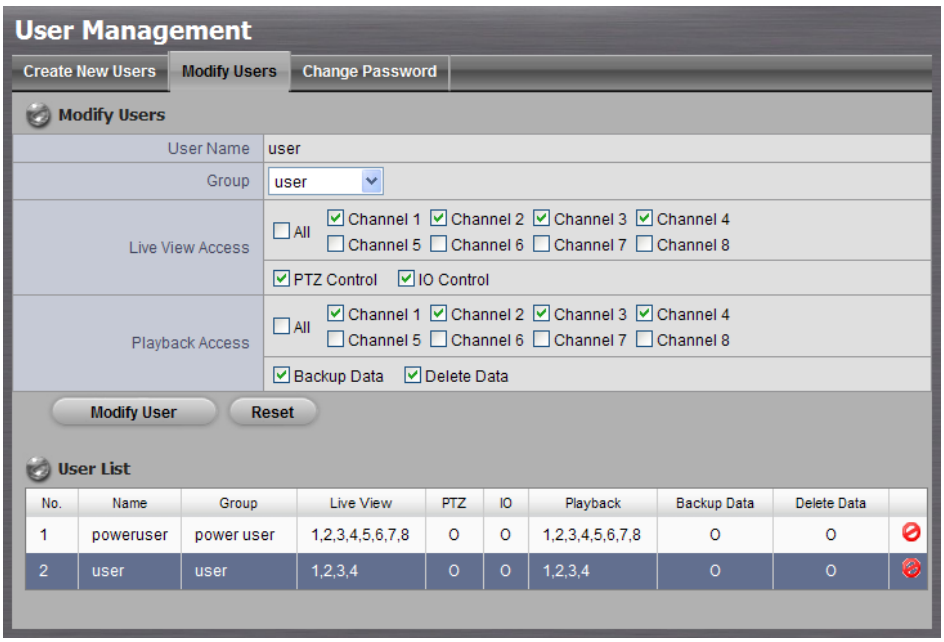
7. Select the live view cameras which this user can access.
8. Select the playback channels which this user can access.
9. Check whether this user can backup or delete recorded data.
10. Click the **Create New User** button to finish it.

Note

The Administrator will be the only user who can use all of the functions. There is a default administrator account in the system, and you cannot create another “Administrator” account.

2.6.3 Modify User Information

1. Open Internet Explorer and log in to the unit.
2. Click **Management** / **User Management**.
3. Click the **Modify Users** tab.
4. Click one of the users in the User List on the bottom of this page.



5. Change the group of this user.
6. Select the live view cameras which this user can access.
7. Select the playback channels which this user can access.
8. Check whether this user can backup or delete recorded data.
9. Click the **Modify User** button to finish it.

2.6.4 Change a User’s Password

1. Open Internet Explorer and log in to the unit.
2. Click **Management** / **User Management**.

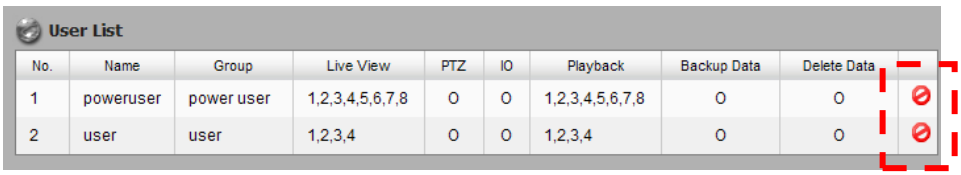
3. Click the **Change Password** tab.

4. Choose the user.
5. Enter a new password.
6. Enter this new password again.
7. Click the **OK** button.

2.6.5 Delete Users

Except for the administrator, you can delete any users with the following steps.

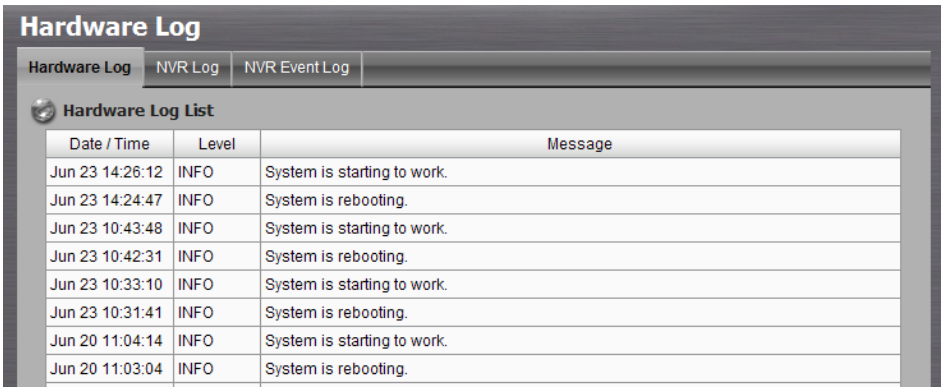
1. Open Internet Explorer and log in to the unit.
2. Click **Management** / **User Management**.
3. Click the **Modify Users** tab.
4. Click the Delete icon of the user you want to delete.


User List
No. Name Group Live View PTZ IO Playback Backup Data Delete Data
1 poweruser power user 1,2,3,4,5,6,7,8 O O 1,2,3,4,5,6,7,8 O O
2 user user 1,2,3,4 O O 1,2,3,4 O O

5. In the confirmation box, click the **OK** button.

2.6.6 View the Event Log

1. Open Internet Explorer and log in to the unit.
2. Click **Management** / **Event Log** to find the event list of your unit.



There are three kinds of event which will be listed on this page.

- **Hardware Log**: The log information of the operations to your unit, such as reboot or shutdown.
- **NVR Log**: The log information of the NVR system, such as system, recording, user access information, POS and auto backup.
- **NVR Event Log**: The log information of the “Event & Action Management”, such as motion detection or camera connection lost.

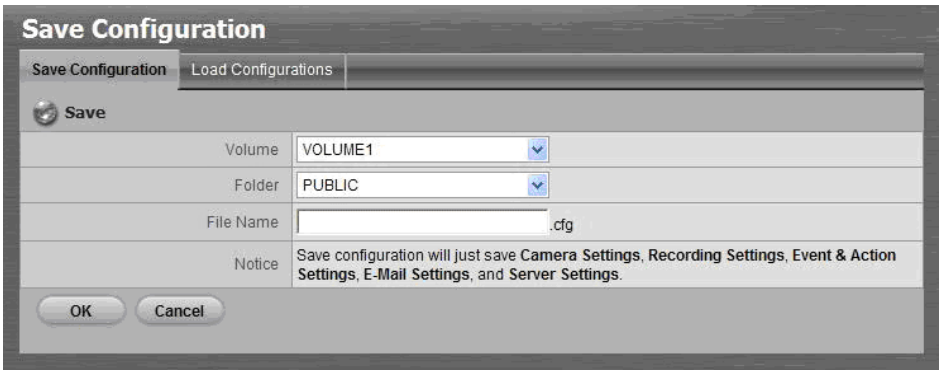
Note

The NVR Event Log will be recorded only if event is selected on Event & Action Management page.

2.6.7 Save Unit Configuration

Save configuration can let you save the settings of this unit. These settings can be applied to other units, which will let you set other units more easily.

1. Open Internet Explorer and log in to the unit.
2. Click **Management / Save / Load Configuration**.
3. Click the **Save Configuration** tab.

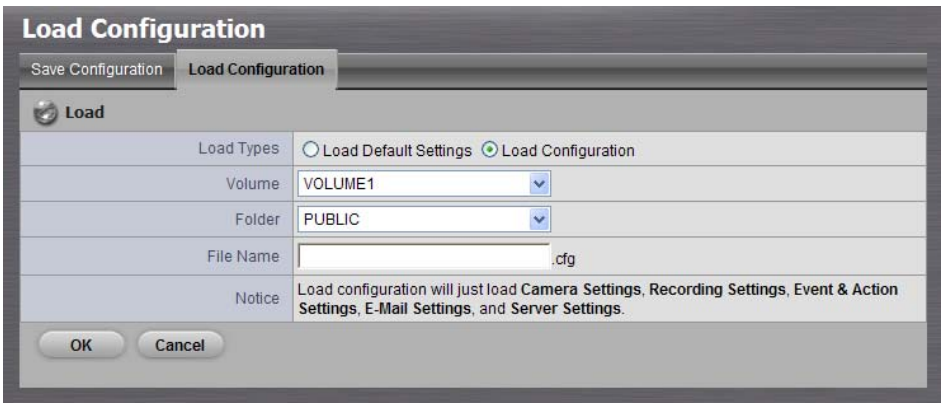


4. Choose the volume.
5. Choose the folder which the configuration file will be generated into.
6. Insert the file name.
7. Click the **OK** button.
8. The configuration file will be generated into the chosen folder.

2.6.8 Load Unit Configuration / Default Settings

Load configuration can let you apply another unit's settings to the current unit. Load Default Settings will revert all of the unit's settings back to the default factory settings.

1. Find your unit through Windows Explorer (insert "\\" plus the IP address of your unit).
2. Use the administrator's ID to log in.
3. Put the configuration file into the folder "public" in your unit.
4. Open Internet Explorer and log in to the unit.
5. Click **Management / Save / Load Configuration**.
6. Click the **Load Configuration** tab.



7. Check the **Load Configuration** or the **Load Default Settings** option. If choosing Load Default Settings, jump to step 11 directly.
8. Choose the volume.
9. Choose the folder “public”.
10. Insert the file name.
11. Click the **OK** button.
12. In the confirmation box, type “YES” into the field provided, then click the **OK** button.
13. The system will begin to load the settings into your current unit.

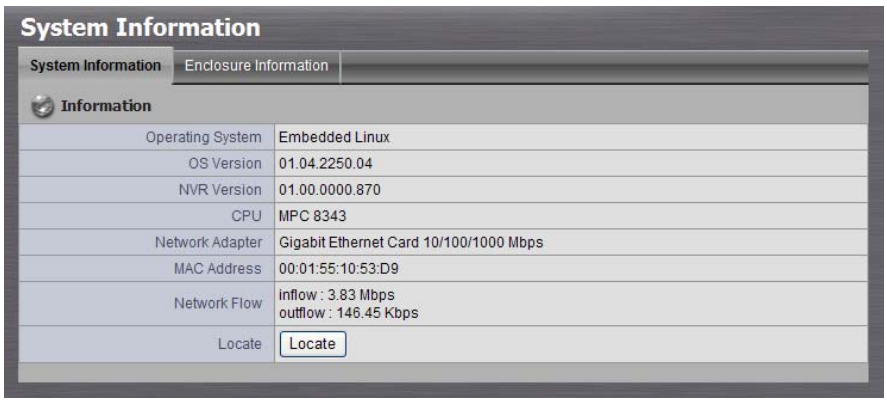
Note

User account and privilege will be kept even if loading default setting, while camera settings, recording schedule, event & action settings, E-mail setting and server settings won’t be.

2.7 System

2.7.1 View System Information

1. Open Internet Explorer and log in to the unit.
2. Click **System / System Information**.
3. Click the **System Information** tab.



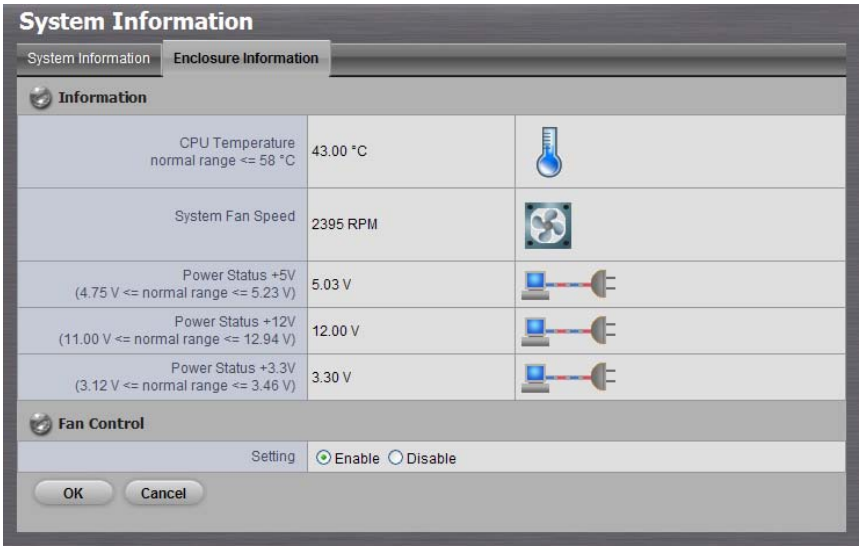
The system information includes the following items.

- **Operating System**: Embedded Linux

- **OS Version**: OS version
- **NVR version**: NVR system version
- **CPU**: CPU model number
- **Network Adapter**: Network type and speed
- **MAC Address**: MAC address of this unit
- **Network Flow**: Input/ output network flow
- **Locate**: The buzzer in the unit will sound to let you know where the unit is.

2.7.2 View Enclosure Information

1. Open Internet Explorer and log in to the unit.
2. Click **System / System Information**.
3. Click the **Enclosure Information** tab.



The enclosure information includes the following items.

- **CPU temperature**: Normal range <= 58℃
- **System Fan Speed**: Normal range >= 1800 RPM
- **Power Status 5V**: 4.75 V <= normal range <= 5.23 V
- **Power Status 12V**: 11.00 V <= normal range <= 12.94 V
  Power Status 3.3V: 3.12 V <= normal range <= 3.46 V

Note

If any value is out of specification, see **10.9 Check Enclosure Status** for details.

2.7.3 Upgrade the System

1. Find your unit through Windows Explorer (insert “\\” plus the IP address of your unit).
2. Use the administrator’s ID and password to log in.
3. Put the upgrade file into the folder “public” in your unit.
4. Open Internet Explorer and log in to the unit.
5. Click **System / System Upgrade**.
6. Click the **Firmware Upgrade** tab.

7. Choose the volume.
8. Choose the folder “public”.
9. Select upgrade file or insert the entire file name, including the extension name.
10. Click the **OK** button.
11. The system will begin the upgrade process.
12. After upgrade, the system will restart. You need to re-access the unit again after this.

Caution

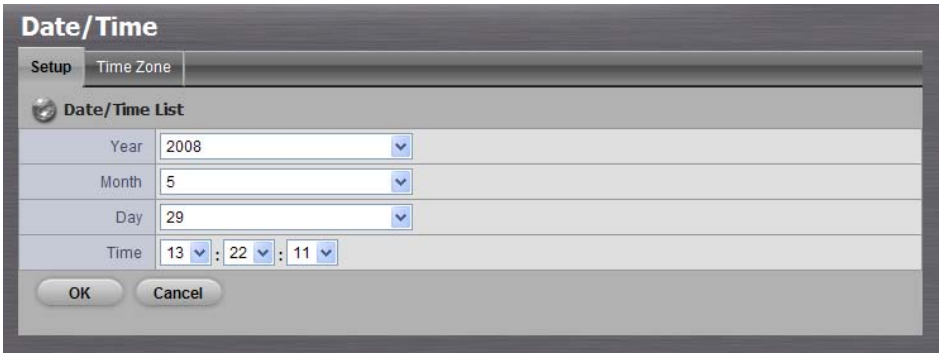
If the current FW version is **v1.0** (NVR FW: 01.00.XXXX.951), please upgrade to **v1.2** (NVR FW: 01.00.XXXX.1247) before upgrading to further versions.

FW version reference: http://192.168.1.141/mediawiki/index.php/NVRmini_versions

2.7.4 System Date and Time Setup

1. Open Internet Explorer and log in to the unit.

2. Click **System / Date / Time**.
3. Click the **Setup** tab.



4. Choose the year.
5. Choose the month.
6. Choose the day.
7. Choose the time.
8. Click the **OK** button.

Caution

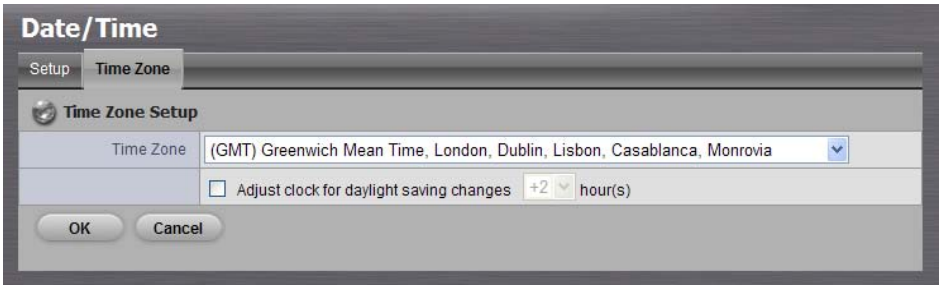
When you modify the date or time of the system, the system may find the wrong data when searching the recorded data. Backup the recorded data before changing the time.

Note

After you modify the date or time of the system, you need to restart it.

2.7.5 Daylight Saving Time Setup

1. Open Internet Explorer and log in to the unit.
2. Click **System / Date / Time**.
3. Click the **Time Zone** tab.



4. Check the **Adjust clock for daylight saving changes** option.
5. Choose the increment for daylight saving time in your location.
6. Click the **OK** button.

2.7.6 Enable and Disable the Buzzer

There is a buzzer in the unit. When the unit finishes booting or when a problem is detected, this buzzer will sound. This buzzer is enabled by default. You can disable/enable this buzzer with the following steps. (We recommend that this buzzer should be enabled.)

1. Open Internet Explorer and log in to the unit.
2. Click **System / Buzzer**.
3. Click the **Setup** tab.

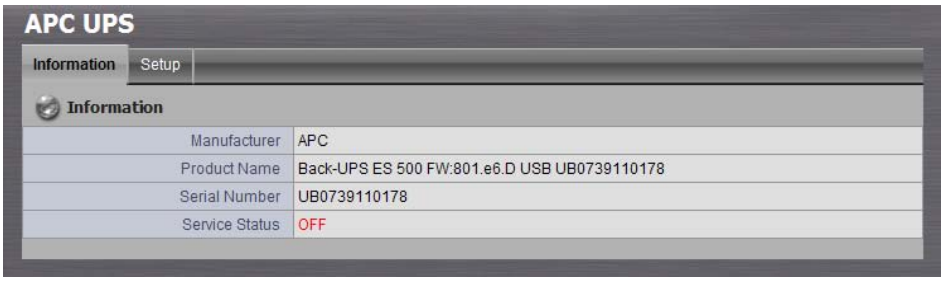
4. Check the **Enable** or **Disable** option.
5. Click the **OK** button.

2.7.7 View UPS Status

If you have an APC Uninterruptable Power Supply (UPS) attached to your unit, you can check its status with the following steps.

1. Open Internet Explorer and log in to the unit.
2. Click **System / APC UPS**.

3. Click the **Information** tab.

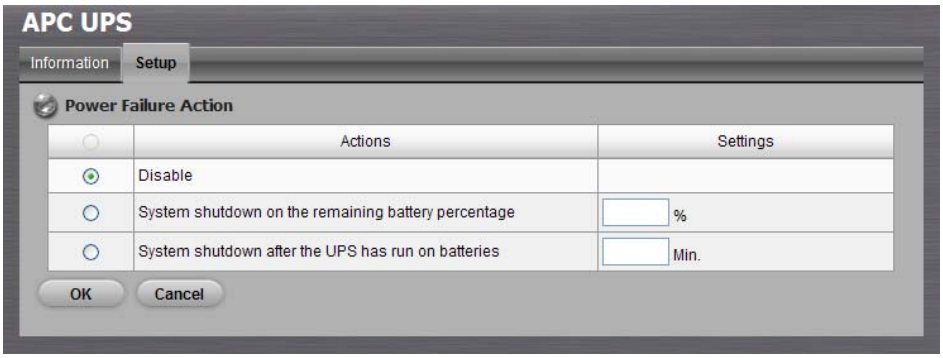


The Information tab displays the status of the UPS. If there is no UPS connected or recognized, the Service Status field reports “NO UPS.”

2.7.8 UPS Setup

This feature enables you to tell your unit how long to run on UPS battery power and when to shutdown, after a power failure.

1. Attach the APC UPS to one of the unit’s USB ports.
2. Open Internet Explorer and log in to the unit.
3. Click **System / APC UPS**.
4. Click the **Setup** tab.
5. Click the option button beside the shutdown option you want:



- **Disable**: Run until the UPS battery is depleted

- **System shutdown on the remaining battery percentage**: Run until the UPS battery remains this percentage.
- **System shutdown after the UPS has run on batteries**: Run on the UPS battery for a certain period of time.

6. If you choose battery percentage, enter a percentage amount in the % field.
7. If you choose running time, enter the number of minutes into the Mins. field.
8. Click the **OK** button.

2.7.9 Auto Power On

Automatically turn on the power when power resumes after power loss.

1. Open Internet Explorer and log in to the unit.
2. Click **System / Power**
3. Check the **enable** option.

4. Click the **OK** button.

2.7.10 Restart the Unit

1. Open Internet Explorer and log in to the unit.
2. Click **System / Reboot / Shutdown**.
3. Click the **Options** tab.

4. Check the **Reboot** option.
5. Click the **OK** button.
6. In the confirmation box, click the **OK** button.

The restart procedure runs automatically. When the unit is fully online:

- The system status LED turns green (right)
- The buzzer beeps one time (if the buzzer is enabled)

Note

During system restart, none of your files will be accessible from your desktops / laptops.

2.7.11 Shut Down the Unit

The only time you need to shut down the unit is to replace the disk drive cooling fan or the power supply. During and after the shutdown, none of your files will be accessible from your desktops / laptops.

- **Shutdown by Software**

1. Open Internet Explorer and log in to the unit.
2. Click **System / Reboot / Shutdown**.
3. Click the **Options** tab.
4. Check the **Shutdown** option.
5. Click the **OK** button.
6. In the confirmation box, click the **OK** button.

- **Direct Shutdown**

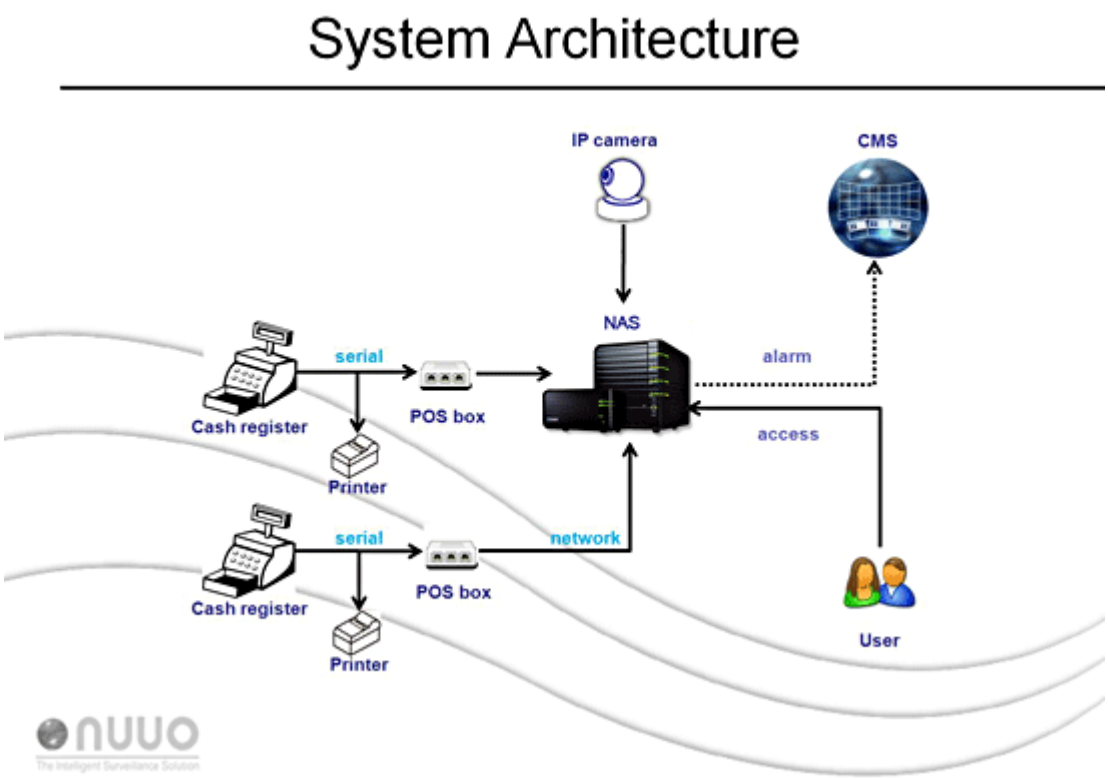
1. Press and hold the power button for 5 seconds on your unit's front panel.
2. The system status LED will turn red.

3. POS

3.1 Introduction

3.1.1 System Introduction

NUUO POS, a Point of Sales Systems based on NUUO NVR/DVR/NVDR/NAS, provides financial transaction's surveillance solution in one central system. The architecture is as below; POS transaction data flows to NAS by Ethernet. Each Cash Register with an external receipt printer is connected by DB9 cable. The transaction information delivered in R232 format can be converted to Ethernet through SCB-C31POS data capture convertor.



Definition of Terms

Terms	Definition
POS Original Data	Original data from POS. Usually with a lot of symbols and no line feed.
POS Transaction	Filtered result by user-defined tag-filter.

Product Specification

NUUO POS Box SCB-C31	
Input	RS232
Output	Ethernet
DC In	DC +10V to +15V
Power consumption	500 mA
Operating Temperature	-20 to 65℃
Operating Humidity	0-90 % Non-Condensing
Baud Rate	110 bps to 230.4 kbps
Data Bits	5, 6, 7 or 8
Stop Bits	1, 1.5 or 2
Parity	None, Even, Odd, Mark, Space
Flow Control	None, RTX/CTS, XON/XOFF, DTR/DSR

3.1.2 Hardware Installation – SCB-C31

To connect Cash Register, Printer, and SCB-C31 POS data capture convertor together, please follow below steps:

Step 1: Please refer the user manual to setup Cash Register and printer.

Step 2: Using a “Y-shape” DB-9 cable, one DB-9 female connect to POS system and one DB-9 male connect to the receipt printer Y-shape (provided by Printer vendor).

Step 3: Using another DB-9 female connect to SCB-C31 POS Data Capture R232/Ethernet convertor with Null modem.

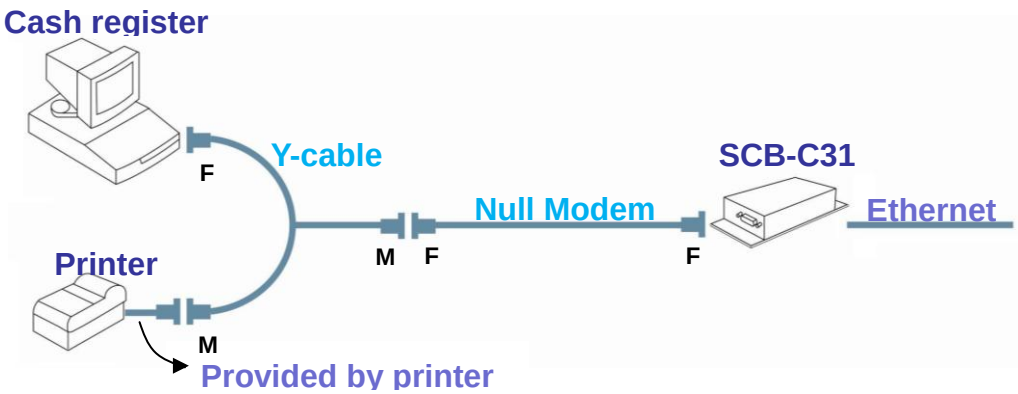
Note

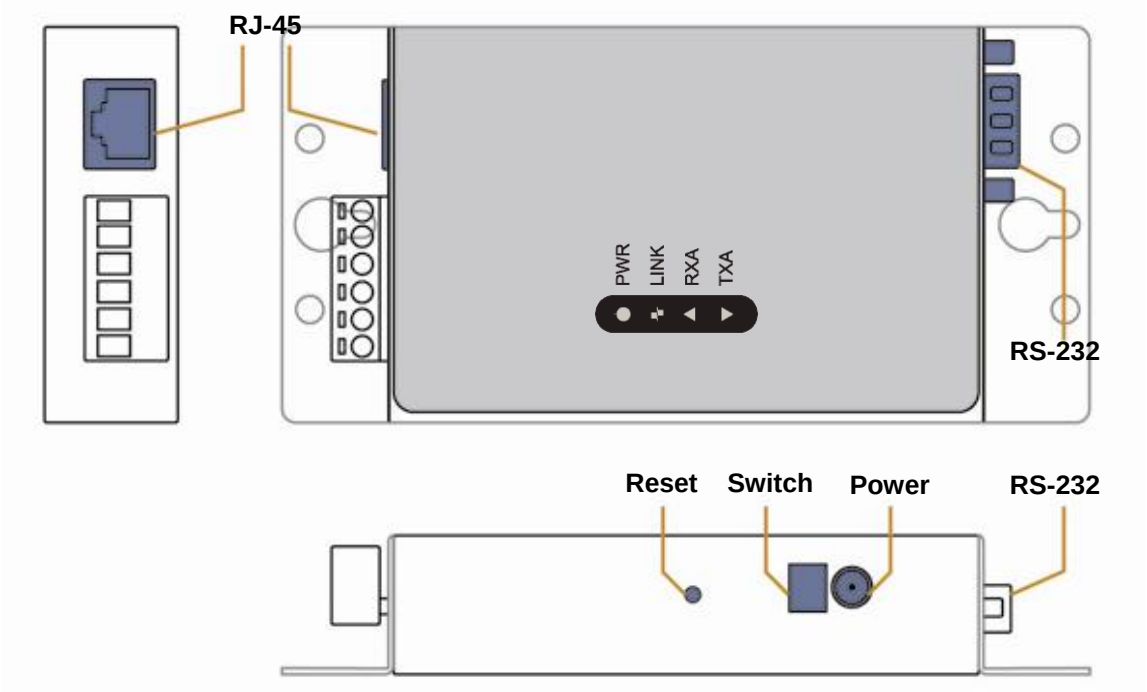
There are two kinds of serial cable: Straight pass-through and Null-Modem. The connection between SCB C31 POS Data capture box and Y-cable must be null modem (in package).

Step 4: Check the system switch of the SCB-C31 is switch to OFF, OFF position.

Step 5: Connect power source with SCB-C31.

Step 6: Connect SCB-C31 with internet port by RJ45 LAN cable.

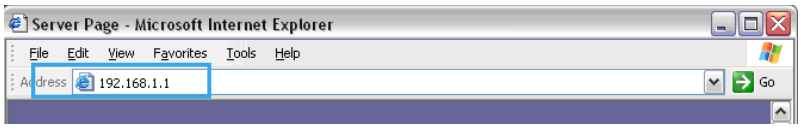




The LED Indicators:
PWR LED: System is ready (Blinking).
LINK LED: Ethernet cable connection and data active.
RXA LED: Transiting/Receiving Indicator.
TXA LED: No option of SCB-C31

3.1.3 Software Installation – SCB-C31

Step 1: Use IE-browser to setup SCB-C31, the default IP address is **192.168.1.1**



Step 2: Setup IP address and password in **Server** page, and then setup IP address.

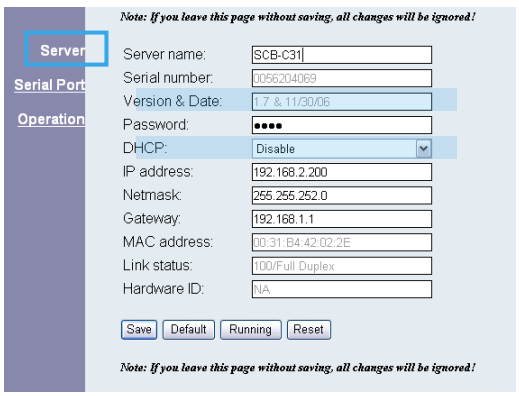
Note

Each time you switch the page of the web, please click **Save** at first. If you leave this page without saving, all changes will be ignored.

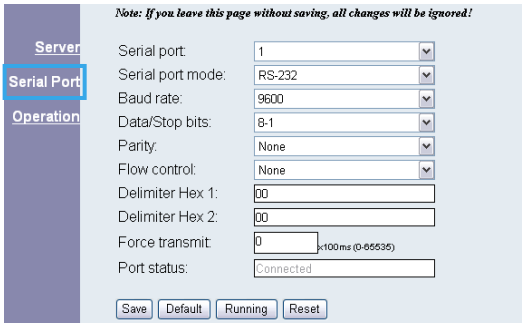
Step 3: Setup Password if needed. Password is only using to activate a security feature on the serial server. Once a password is entered it will be required to access the menu and make change of configuration when access.

Note

Please write down the Serial number and MAC address, these two parameters are necessary when user forget your password.



Step 4: Switch to **Serial Port** page, and setup according to your POS or Cash Register. Usually all devices are default setting, you can reserve your time to pass this step.



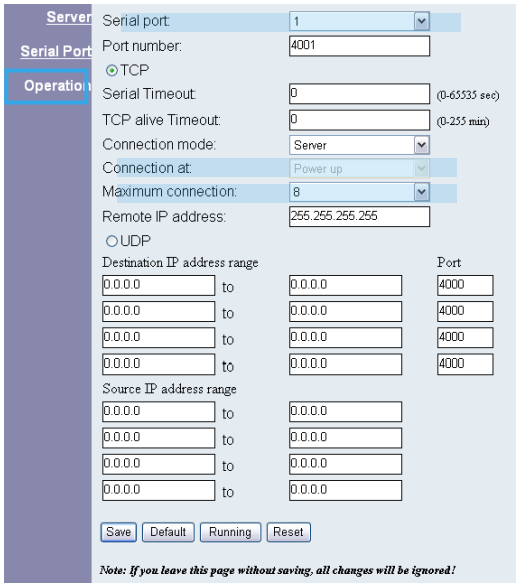
Step 5: Switch to **Operation** page. Setup below parameters:

1. **Port number**: The default port is 4000.
2. **Maximum Connection**: Set maximum number of connection to this IP.

Note

To avoid connection fail caused by no available connection, please make sure the value is 8.

3. **Remote IP address**: It means which IP have authority to access box IP. The default 255.255.255.255 will allow all IP to access the box.



Step 6: Please **restart/reset** the box after changing configurations to active setup.

To reset the unit manually apply power, insert a small plastic tool, and press lightly depressing reset located between the switch. Hold for 3 seconds and release. The Link and Run light will go out and turn back on. The SCB-C31 will revert to the last setting.

Note

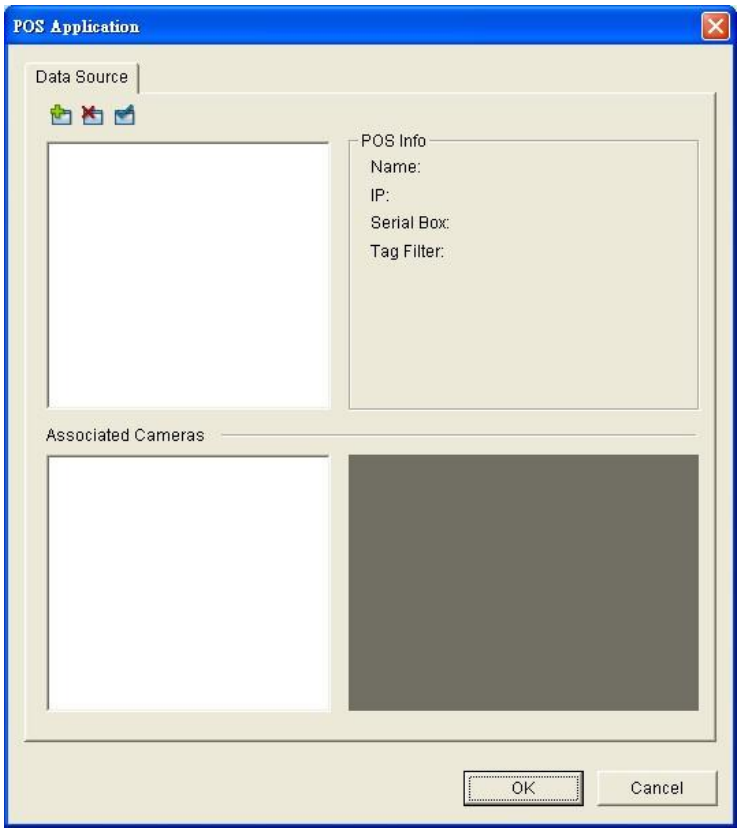
Ever time you change the configuration of SCB-C31, please check above setting, especially maximum connection and Remote IP address to avoid connection fail.

3.2 Software Setup

3.2.1 NVR POS Setting

1. Open Internet Explorer and log in to the unit.
2. Click **POS** / **POS Settings**.

3. Click the **Settings** tab to set POS application.



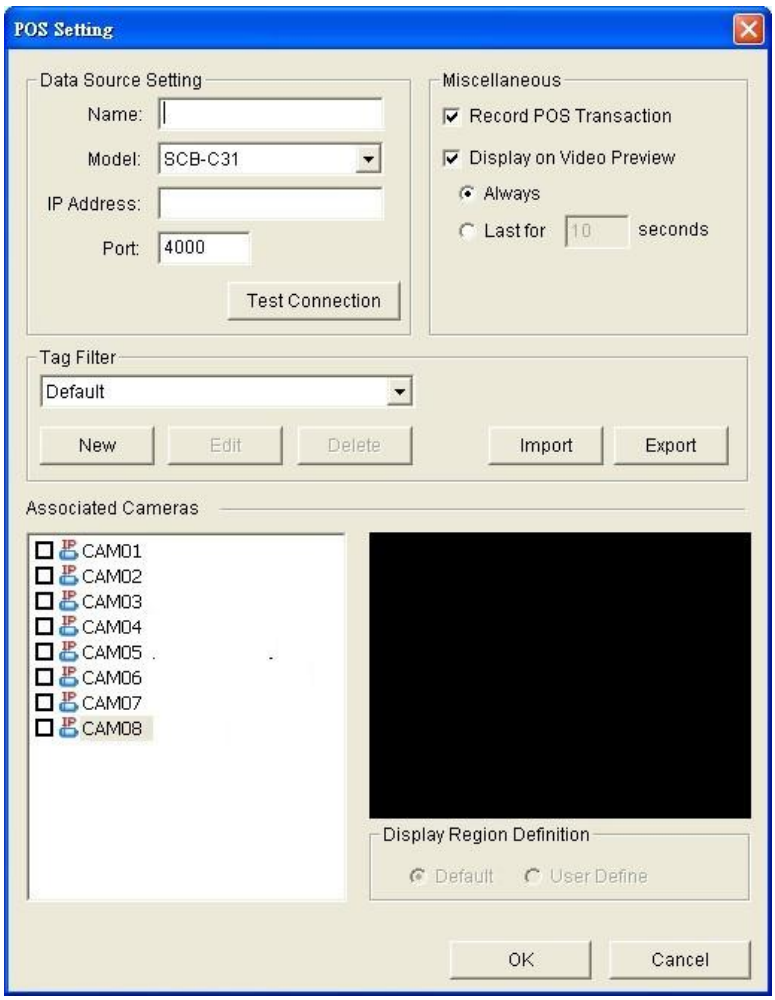
- **Data Source**: List of all the data sources.
  - Insert: Click to insert POS and do the POS settings. See **3.2.2 Insert POS Setting** for details.
  - Delete: Click to remove the selected POS from the list. See **3.2.3 Delete POS Device** for details.
  - Configure: Click to configure the selected POS and modify the POS settings. See **3.2.4 Configure POS Setting** for details.
- **POS info**: The setting information of the selected POS on this window.
  - Name: Name of the POS data source.
  - IP: IP of the POS data source.
  - Serial Box: The serial box data source used.
  - Tag Filter: Tag type to filter the data from POS. See **3.3 Tag Filter** for details.
- **Associated Cameras**: List of all the associated cameras of the

selected POS.

4. Click the OK button to finalize the modification.

3.2.2 Insert POS Setting

1. Click **Insert** button to open the **POS Setting** window.
2. Set up basic data source, including **Name**, **Model**, **IP address**, and **Port**.
3. After setting, click **Test Connection** to test POS device connection.



4. Set up Miscellaneous options, including **Record POS Transaction** and **Display on Video Preview**.

- **Record POS Transaction**: Select this checkbox to record POS transaction data. Users are allowed to search the POS data.
- **Display on Video Preview**: Select this checkbox to display POS transaction overlay on associated camera live video. Two types of

transaction data display time:

- Name: Name of the POS data source.
- Always: Keep transaction data on video until receiving next transaction date.
- Last for ___ seconds: Each transaction data only lasts on video for ___ seconds after receiving the last data of transaction.

5. Select **Tag Filter**. See **3.3 Tag Filter** for details.
6. Select the camera of **Associated Cameras** to display POS transaction data overlay on live video.
7. Set up display area for each camera video in **Display Region Definition**.

- **Default**: The default display area is in the upper left corner of video image.
- **User Define**: Enable **User Define**, and define display area by dragging rectangle

8. Click the **OK** button to save.

3.2.3 Delete POS Device

1. Choose POS device.
2. Click **Delete** button to remove this POS device from the system.

3.2.4 Configure POS Setting

1. Choose POS device.
2. Click **Configure** button to open the POS Setting window.
3. Refer to **3.2.2 Insert POS Setting** to modify configuration.

3.3 Tag Filter

The original transaction data from POS system is hard to read. Users can define filters to make the POS strings meaningful. The system also provides a simple default tag filter to filter out same common EPSON commands, users can base on this default tag filter to edit their customized filters.

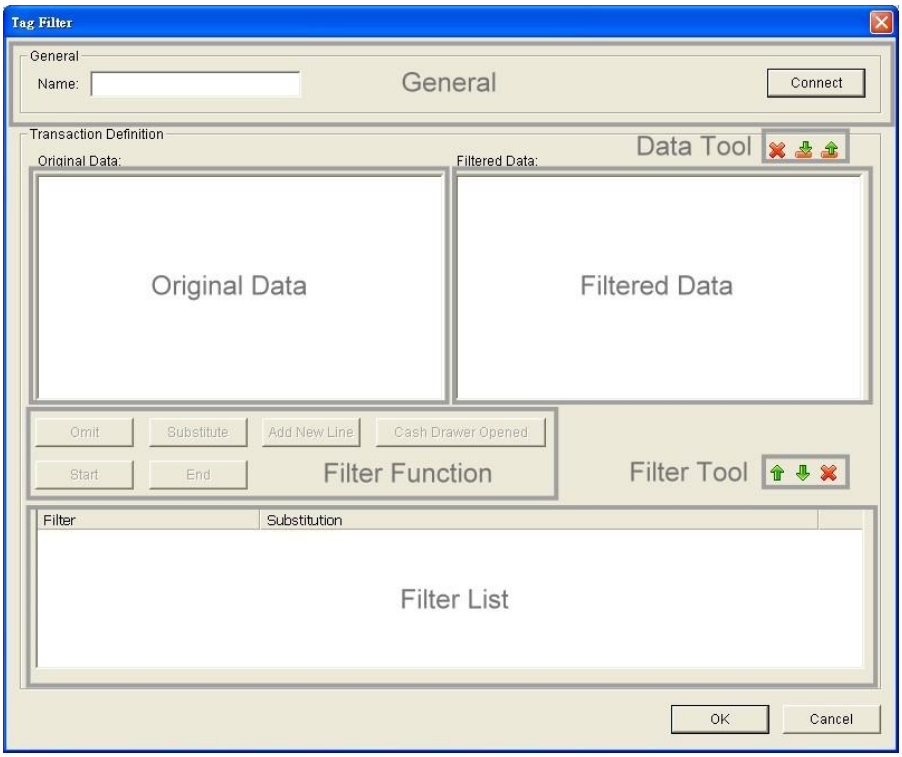
3.3.1 Add New Tag Filter

1. Click **Insert** button or choose a device and click **Configure**

button to open the **POS Setting** window.

2. Click **New** to open tag filter window.

- **General**: Name of Tag Filter and Connect button.
- **Original Data**: Original transaction data from POS device.
- **Filtered Data**: Filtered data after definition.
- **Filter Function**: Tool used for defining filter type.
- **Filter List**: List of all filters.
- **Data Tool**: Clear/import/export buttons to clear/import/export the original and filtered data.
- **Filter Tool**: Upper/down buttons to arrange the priority of each filter; remove button to remove the filter from list.

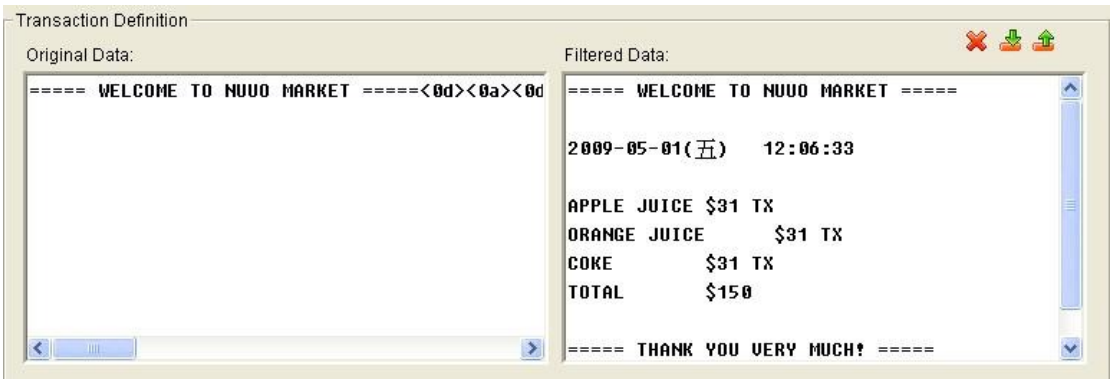


3. Enter name of this tag filter.
4. Click **Connect** button to capture POS transaction data from POS device. The original transaction data will be shown on the left window.

Note

If you don't want the data keep importing when editing filter, click **Disconnect** button to stop connecting.

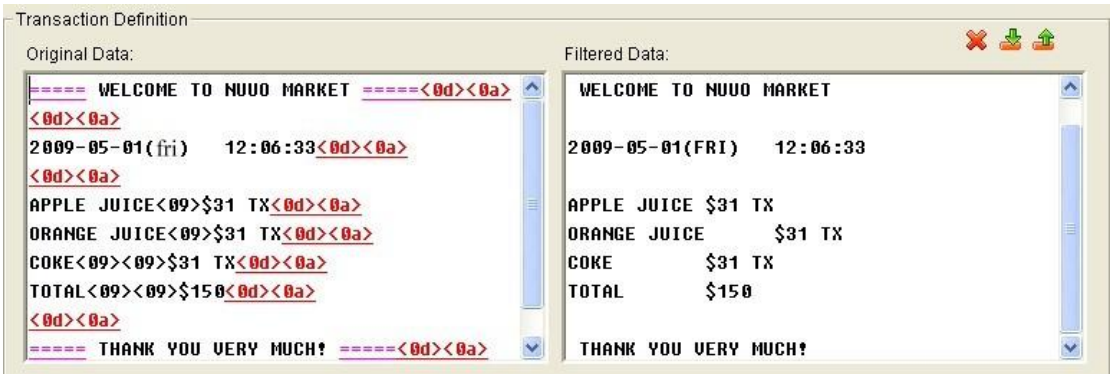
5. Data Tools
   - Clear: Remove data from Original Data window and Filtered Data window.
   - Import: Reload exported binary data.
   - Export: Capture and export original binary data.
6. Start to edit tag filters. Click and drag to select text from Original Data window, and then use the below six buttons to define filters. The filtered transaction data will be shown on the right window.



- **Omit**: Neglect the selected text which is meaningless or not important. The text will disappear on the right window.

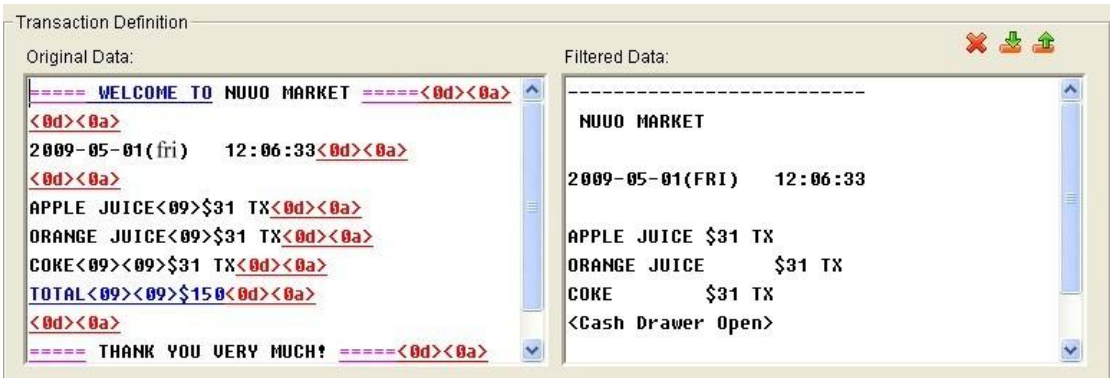
- **Substitute**: Use another word(s) to replace the selected text. The system will pop up a substitution panel for replacing word(s) users want. The replaced text will be shown on the right window.

- **Add New Line**: Define the selected text as the symbol for changing to new line. The result will be shown on the right window.



- **Start**: Define the selected text as the symbol for transaction beginning. The filtered data will be separated line as below.

- **Cash Register Opened**: Define the selected text as the symbol for opening cash register. The filtered data will be shown the **<Cash Drawer Open>** mark as below.



- **End**: Define the selected text as the symbol for transaction ending. The filtered data will be separated line as below.

7. Filter Tools
   - Up: Move a tag filter up; the upper filter will be operated earlier.
   - Down: Move a tag filter down; the lower filter will be operated later.
   - Delete: Remove a filter from this tag filter list.

8. Click the **OK** button to save.

3.3.2 Edit Tag Filter

1. Select Tag Filter name from drop-down menu.
2. Click **Edit** button.
3. Configure the Tag Filter window.
4. Click the **OK** button to save.

3.3.3 Delete Tag Filter

1. Select Tag Filter name from drop-down menu.
2. Click **Delete** button to delete it.

3.3.4 Import/Export Tag Filter

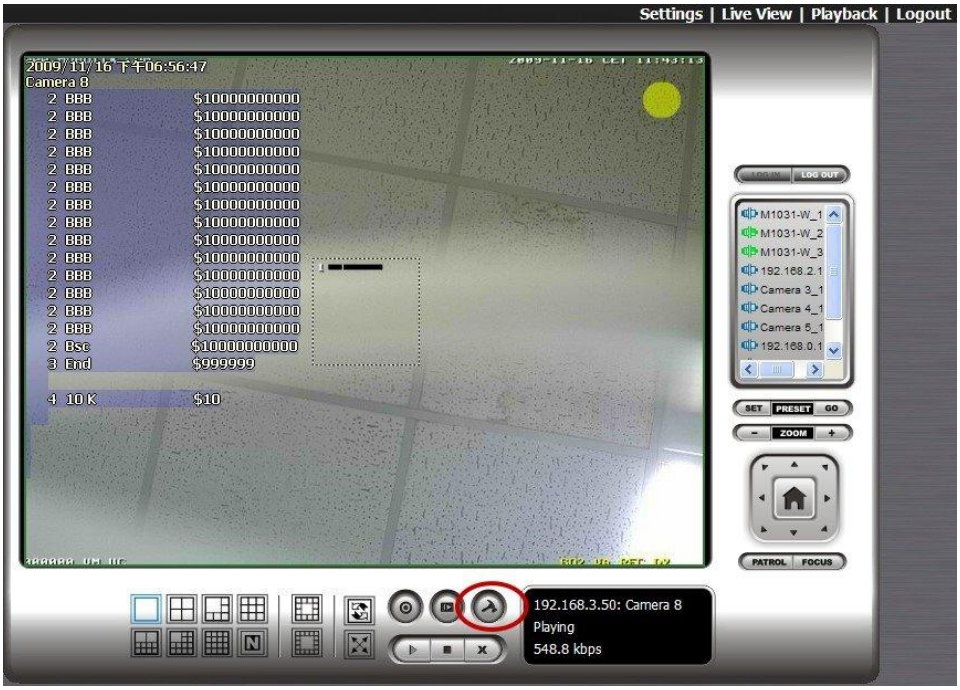
1. Click **Import/Export** button and select Import/Export URL.
2. Click **Open/Save** to Import/Export Tag Filter.
3. After importing tag filters, users can simply select tag filter from drop-down menu without editing new tag filter.

3.4 POS Display Font

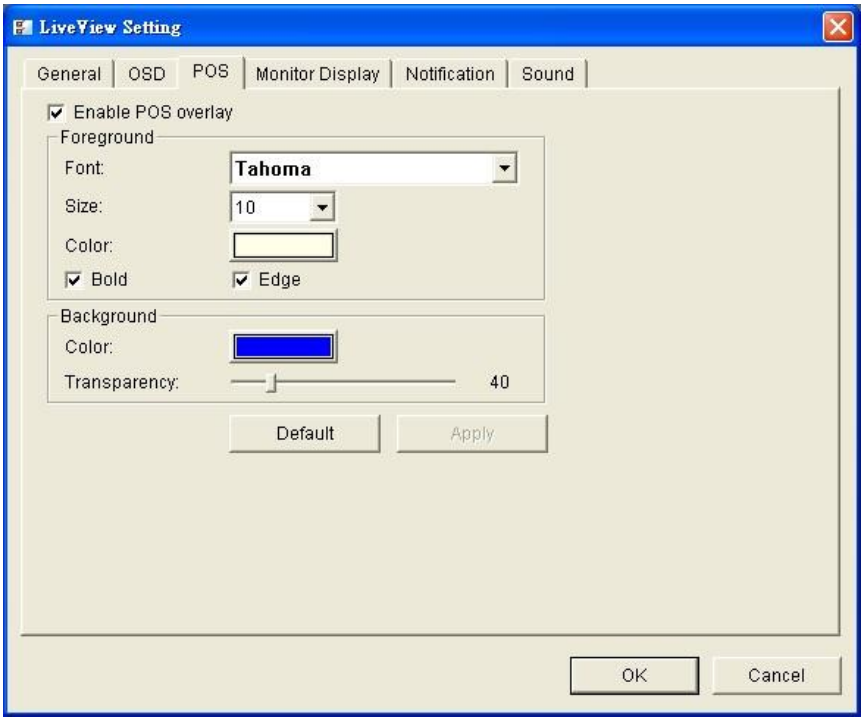
The system allows users to set up the fonts of POS transaction data on live view video and playback video.

3.4.1 Live View

1. Open Internet Explorer and log in to the unit.
2. Click the **Live View**.
3. Click the **General Setting** button to open **Live View Setting** window.



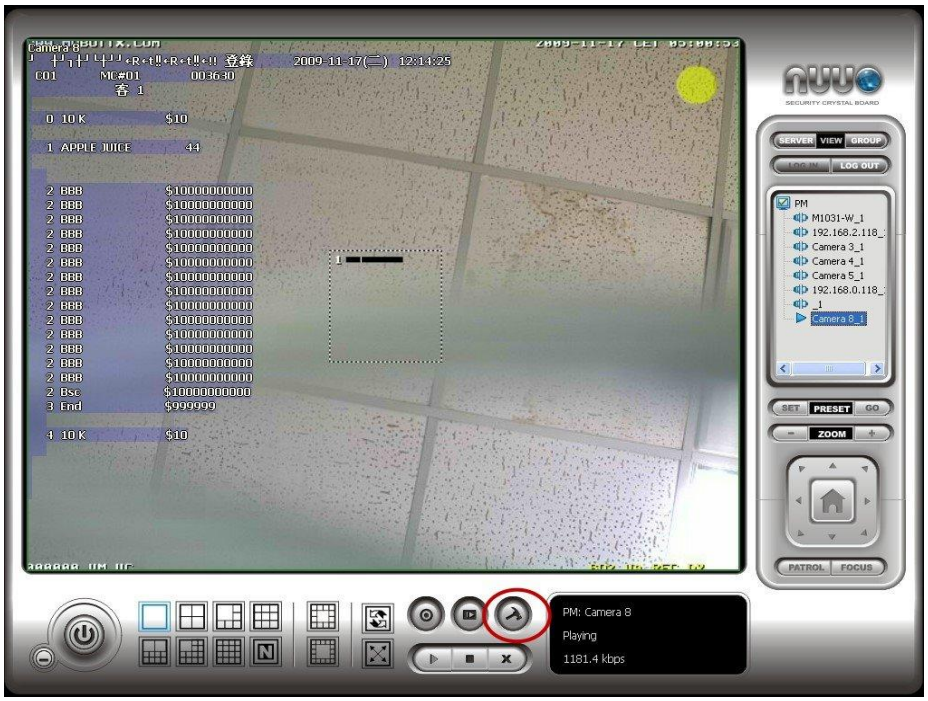
4. Select the font, font size, font color and background for the POS transaction data overlaid the video.



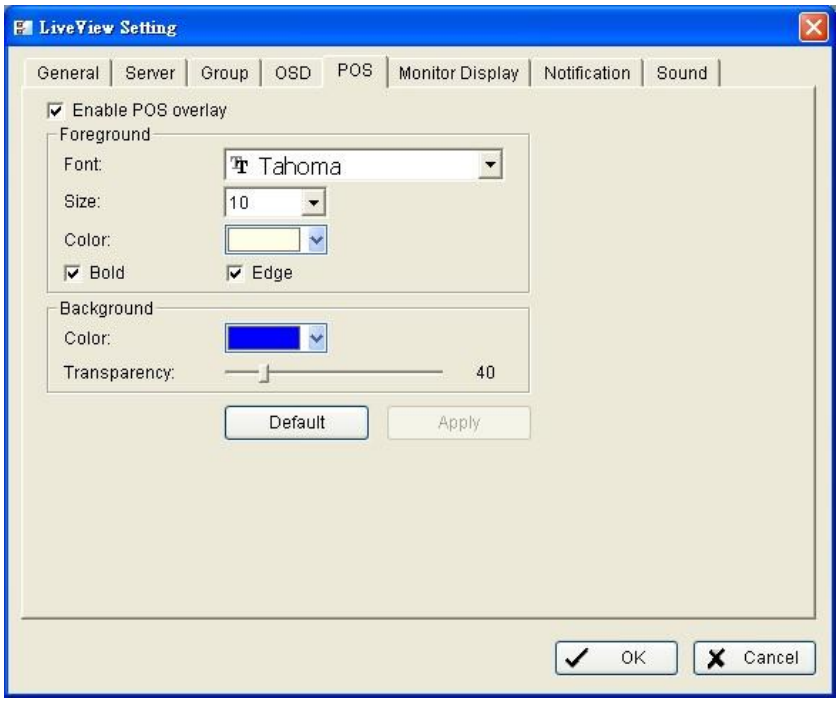
5. Click the **OK** button to save.

3.4.2 Remote Live Viewer

1. Startup > NUUO NVRmini > Remote Live Viewer
2. Click the **General Setting** button to open **Live View Setting** window.



3. Select the font, font size, font color and background for the POS transaction data overlaid the video.

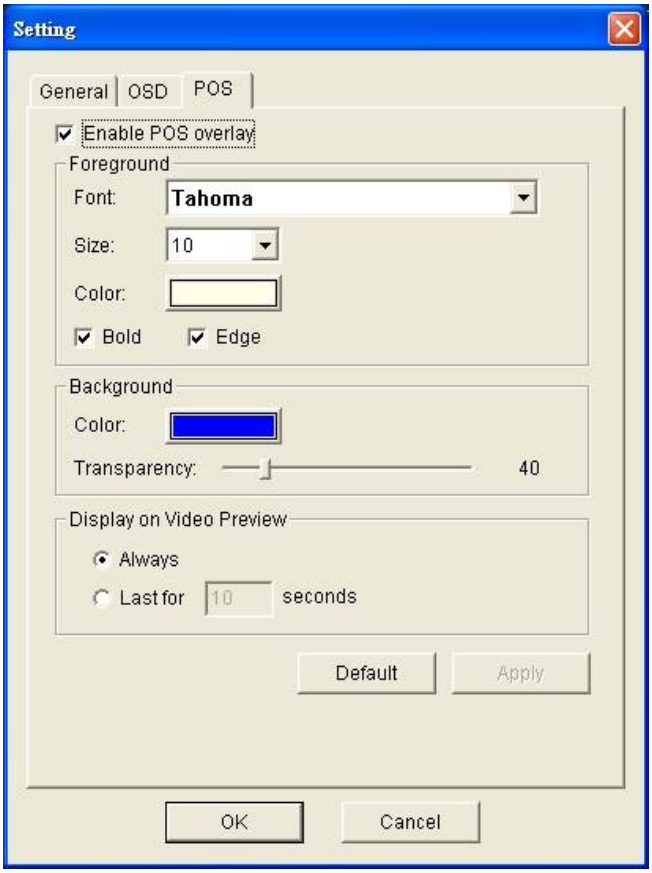


4. Click the **OK** button to save.

3.4.3 Playback

1. Open Internet Explorer and log in to the unit.
2. Click the **Playback** button.
3. Click the **Setting** button to open **Setting** window.

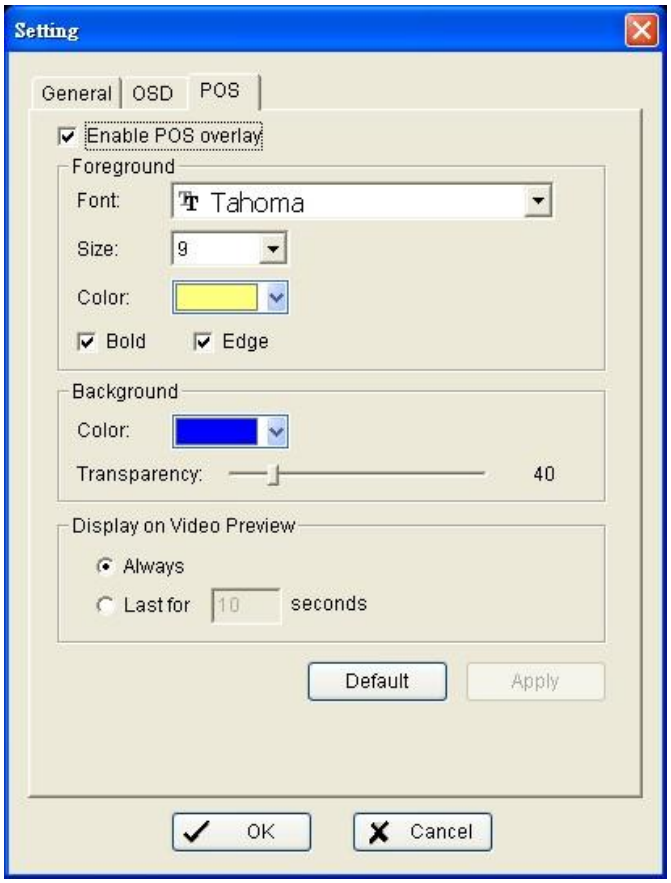
4. Select the font, font size, font color and background for the POS transaction data overlaid the video. Also, select the type of transaction data display time.



3.4.4 Playback System

1. Startup > NUUO NVRmini > Playback System
2. Click the **Setting** button to open **Setting** window.

3. Select the font, font size, font color and background for the POS transaction data overlaid the video. Also, select the type of transaction data display time.



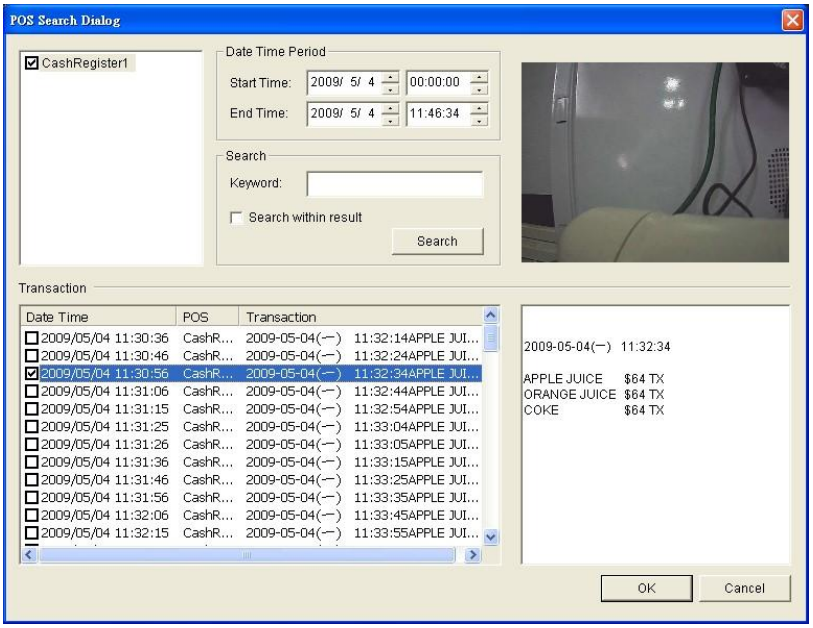
3.5 POS Transaction Data Search

POS Search tool is used to search key word of all transaction data.

3.5.1 Search POS Transaction Data through Playback

1. Open Internet Explorer and log in to the unit.
2. Click the **Playback** button.
3. Click the **Open Record** button to open **Data Time Search Dialog** window.

4. Click the **POS Search** button to open **POS Search Dialog** window.



5. Select a POS device(s) from the POS list.
6. Set up Start Time and End Time in **Data Time Period** section.
7. Enter the keyword you want to search.
8. Click the **Search** button, the results will be shown in Transaction table.
9. Select an item from Transaction table, the transaction detail will be shown in the table of lower right corner, and the recorded video of associated camera will be shown in the upper right corner.
10. Select the checkbox of **Search within result**, and enter a keyword, you

can search the data within the results.

3.5.2 Search POS Transaction Data through Playback System

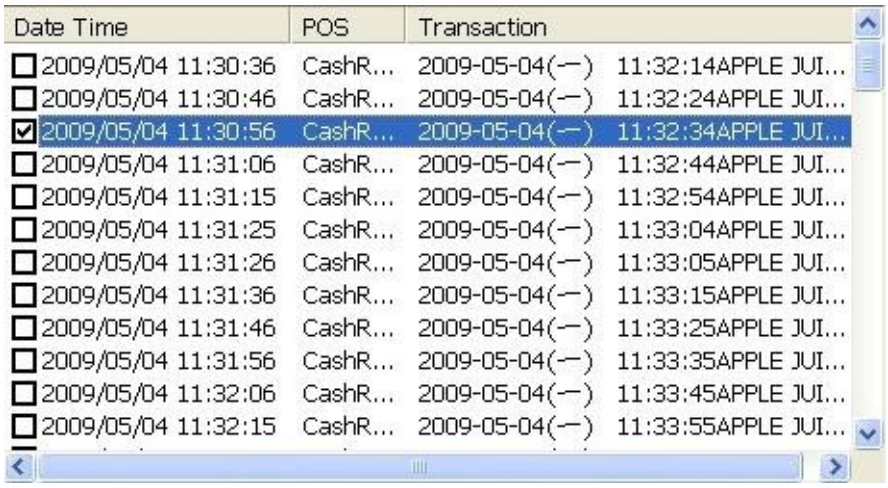
1. Startup > NUUO NVRmini > Playback System.
2. Click the **Open Record** button to open **Data Time Search Dialog** window.
3. Click the **Remote Server Site** icon on the top of the window to select the server users want to access.
4. Follow the step 4 through 10 of **3.5.1 Search POS Transaction Data by Playback** to search the data.

3.6 Playback Video with POS Data

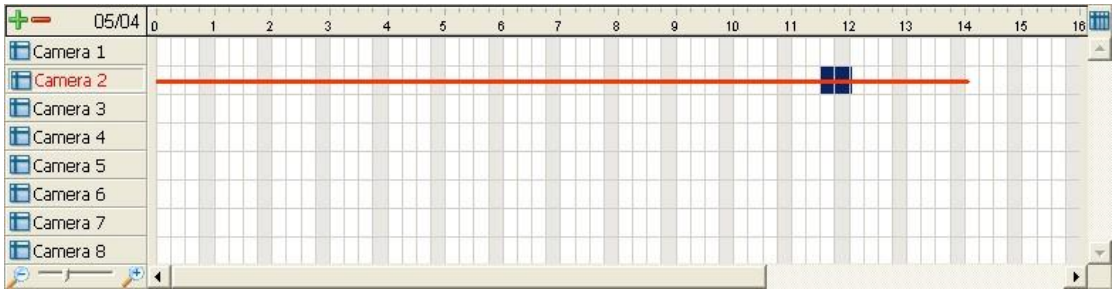
Enable POS overlay in **Setting** window to view recorded video with POS transaction data (Refer to **3.4.3 POS Display Font**). If the option is enabled, the system will auto display transaction data when playing recorded video. There are two modes to select video period.

3.6.1 Select Period by POS Search

1. Refer to **3.5 POS Transaction Data Search**.
2. Select the transaction data from the result list, and click **OK**.



3. The period you select from POS search results will be selected automatically.



4. Click **OK** to playback videos.

3.6.2 Select Period by Data & Time through Playback

1. Open Internet Explorer and log in to the unit.
2. Click the **Playback** button.
3. Click the **Open Record** button to open **Data Time Search Dialog** window.
4. Highlight the video clip you want to review by left-clicking and dragging the time period. You may also utilize the Start Time and End Time in **Date Time Period** section after choosing cameras.
5. Click **OK** to playback videos.

3.6.3 Select Period by Data & Time through Playback System

1. Startup > NUUO NVRmini > Playback System.
2. Click the **Open Record** button to open **Data Time Search Dialog** window.
3. Click the **Remote Server Site** icon on the top of the window to select the server users want to access.
4. Highlight the video clip you want to review by left-clicking and dragging the time period. You may also utilize the Start Time and End Time in **Date Time Period** section after choosing cameras.
5. Click **OK** to playback videos.

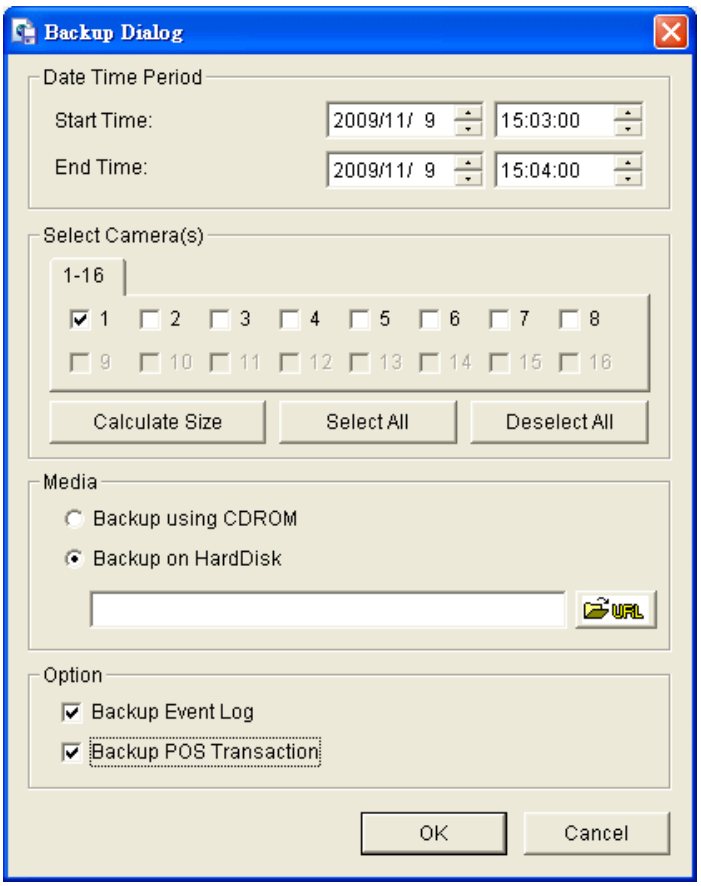
3.7 Backup Video with POS Data

There are three ways to backup video with POS transaction data.

3.7.1 Backup through Internet Explorer

1. Open Internet Explorer and log in to the unit.

2. Click the **Open Record** button to select data.
3. Click the **Backup** button.



4. Check the **Backup POS Transaction** option.
5. Set the Start Time and End Time you want to backup.
6. Select the cameras you want to backup.
7. Select the directory you want to save the backup data.
8. Click the **Backup** button.
9. The system will then begin backup process automatically.

3.7.2 Backup through Playback System

1. Startup > NUUO NVRmini > Playback System.
2. Click the **Open Record** button to select data.
3. Click the **Backup** button.
4. Check the **Backup POS Transaction** option.
5. Set the Start Time and End Time you want to backup.
6. Select the cameras you want to backup.
7. Select the directory you want to save the backup data.

8. Click the **Backup** button.

3.7.3 Backup through Backup System

Please refer to step 1 to 14 of the chapter **6. Backup and Delete Records**, and check the **Backup POS Transaction** option.

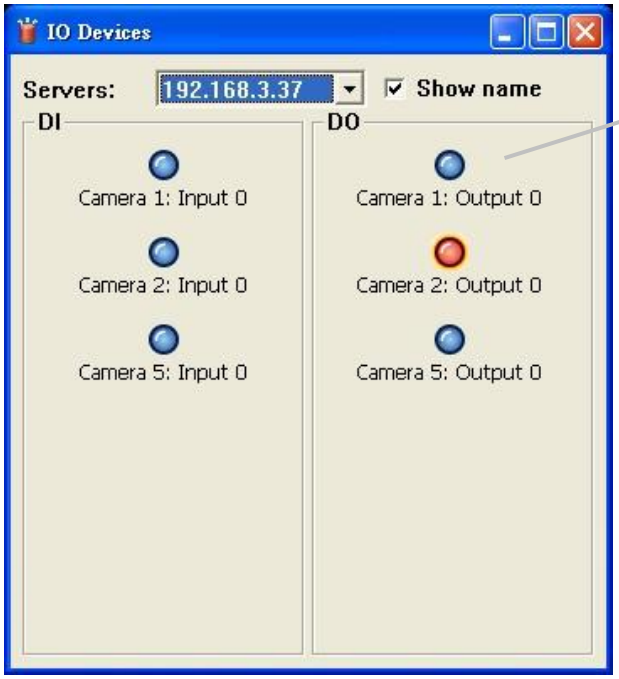
4. Live view

There are two ways to implement the live view function: with Internet Explorer or with the **Remote Live Viewer** application.

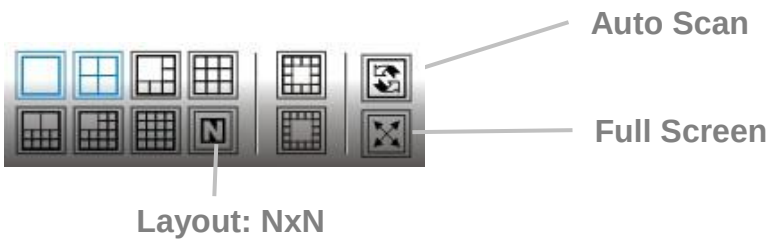
4.1 Internet Explorer

4.1.1 Live View Control Panel

- **PTZ Camera Control**: You may control the camera view by using the PTZ camera control panel to adjust the camera's view. This is only available with cameras that support the PTZ function.
- **Zoom**: Click the **+** or **–** button to zoom in or zoom out the view.
- **Play / Stop / Drop**: Select a camera / video and click this button to play/stop/disconnect a particular channel.
- **Information Display Window**: Display video information including server name, video current status, and bit rate for a selected channel.
- **Remote I/O**: Utilize I/O device function remotely. - User can remotely adjust the Output Pins by turning it on or off.



- **Auto Scan**: Activate auto scan to rotate the channels on the display screen. For instance, you may select to show only 4-split screen on the liveview, while connecting 16 channels to the system. With auto scan function, you are able to see all 16 channels by turns.
- **Layout**: Click to change the multiple-split layout.



You can right click on the camera screen to enable the following function.

- **Enable Move**: Adjust the current view of camera which supports PT function by dragging the button on the display screen.
- **Enable Digital PTZ**: Click the **+** or **–** button to zoom in or zoom out the view. The lower right square flashing on the video grid indicates the correspondent view of the camera.
- **Enable Audio**: Enable audio on active channel(s).
- **Snapshot**: Select the snapshot function to capture a specific video image immediately.
- **Toggle Fullscreen**: Select it to view cameras with full screen. Press “Esc” or right click un-select full screen to go back to the original view.

Also, right click on camera list to duplicate and connect/disconnect designate cameras, and do other functions.

- **Duplicate Camera**: Select the duplicate camera function to create multiple views. The duplicated camera will be shown with green indicator as the right picture. Combine this function with digital PTZ, users are allowed to enlarge different spots and view them in different channels without failing to record the whole view.
- **Connect / Disconnect**: Click to connect or disconnect the designate camera.
- **Login / Logout Server**: Click to login or logout.

- **Connect All / Disconnect All**: Click to connect or disconnect all cameras.

4.1.2 Live View Setting

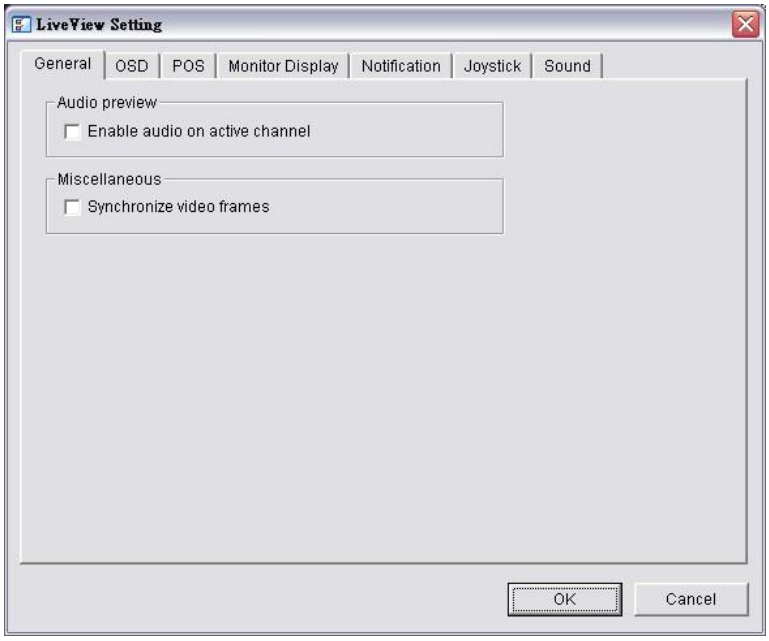
1. Open Internet Explorer and log in to the unit.
2. Set the cameras.
3. Click the **Live View** button on the top of the page.
4. Select a camera(s) from the camera list on the right and then drag it to where you wish the image to be displayed.

Important

When running Internet Explorer, do not use the function “Open in New Window”. Using this function may cause Internet Explorer to become unstable.

4.1.3 General Setting

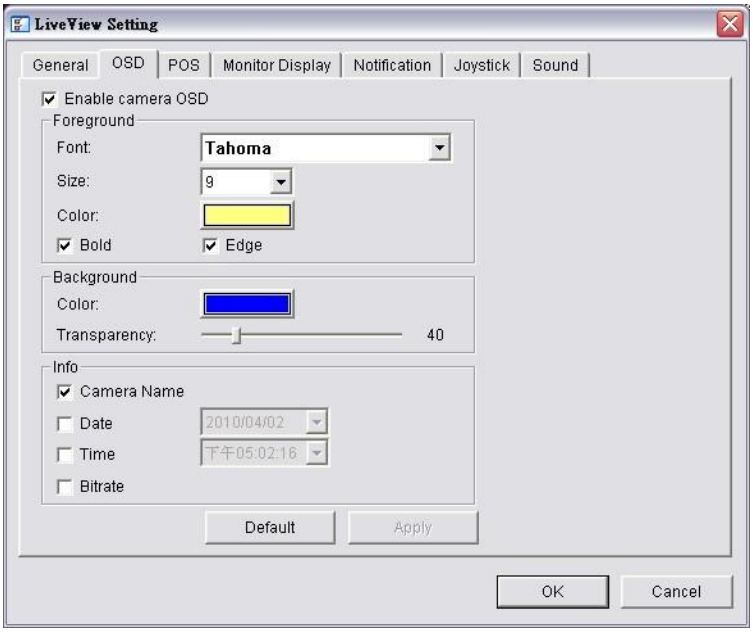
1. Open Internet Explorer and log in to the unit.
2. Click the **Live View** button on the top of the page.
3. Click the **General Setting** button.
4. Click the **General** tab.



5. Check the **Enable audio on active channel** option to enable audio streaming on active channel. This function synchronizes with right click on camera to enable audio.
6. Check **Synchronize video frames** to avoid the tearing problem occurring in video display while increasing the CPU loading.
7. Click the **OK** button.

4.1.4 OSD (On-screen display) Setting

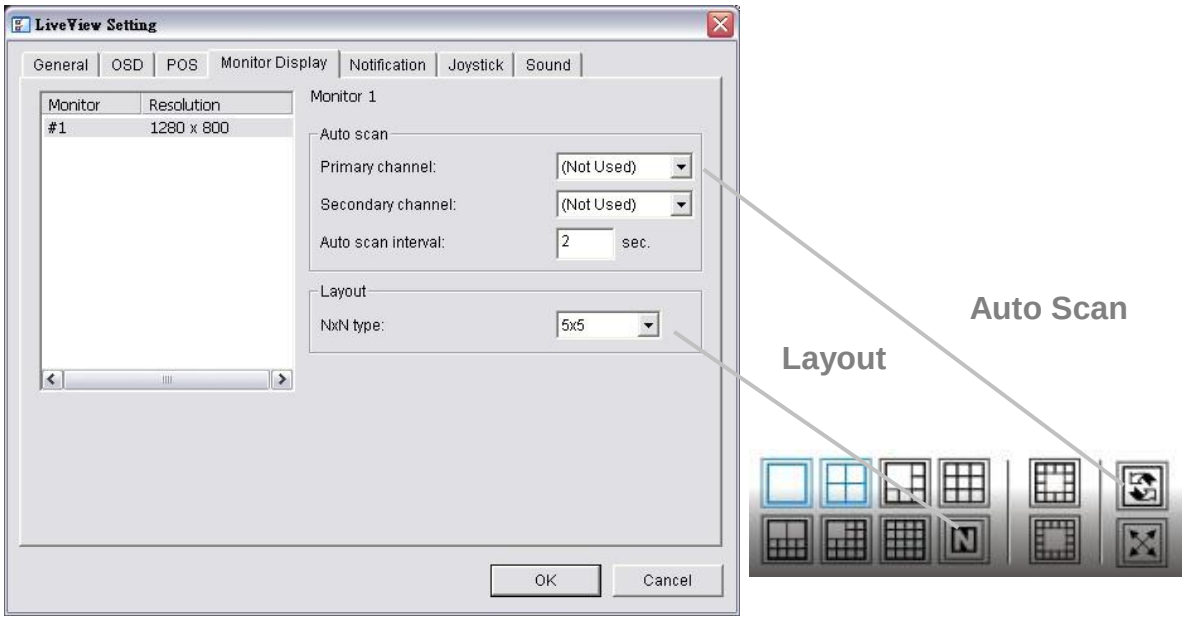
1. Open Internet Explorer and log in to the unit.
2. Click the **Live View** button on the top of the page.
3. Click the **General Setting** button.
4. Click the **OSD** tab.



5. Check the **Enable camera OSD** option.
6. Set the foreground and background settings of the OSD.
7. Select which kinds of information will be displayed on the screen.
8. Click the **Apply** button to preview the result.
9. Click the **Default** button to back to the default settings if necessary.
10. Click the **OK** button.

4.1.5 Monitor Display Setting

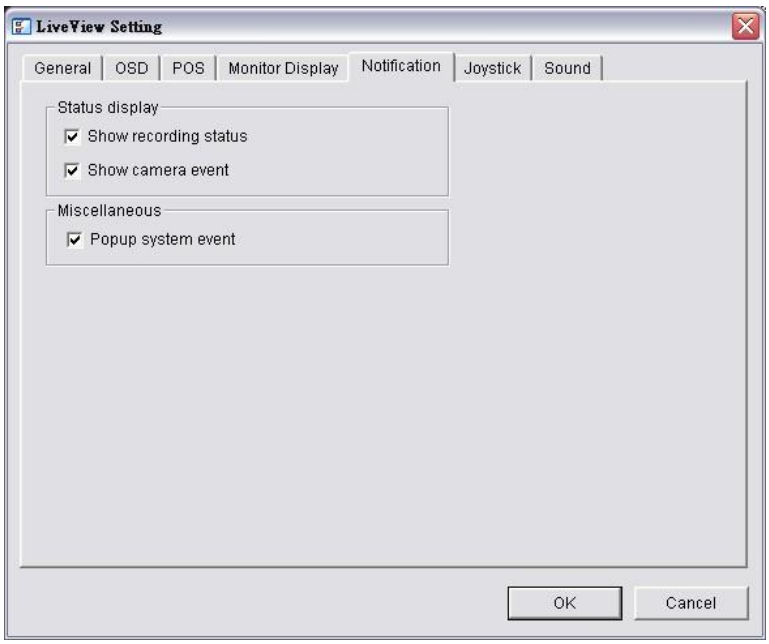
1. Open Internet Explorer and log in to the unit.
2. Click the **Live View** button on the top of the page.
3. Click the **General Setting** button.
4. Click the **Monitor Display** tab.



5. Select **Primary channel** which will always be on the screen when activating auto scan; while select **Secondary channel** which has second priority when activating auto scan. Enter the time interval for auto scan.
6. Select the screen division of NxN type.
7. Click the **OK** button.

4.1.6 Notification

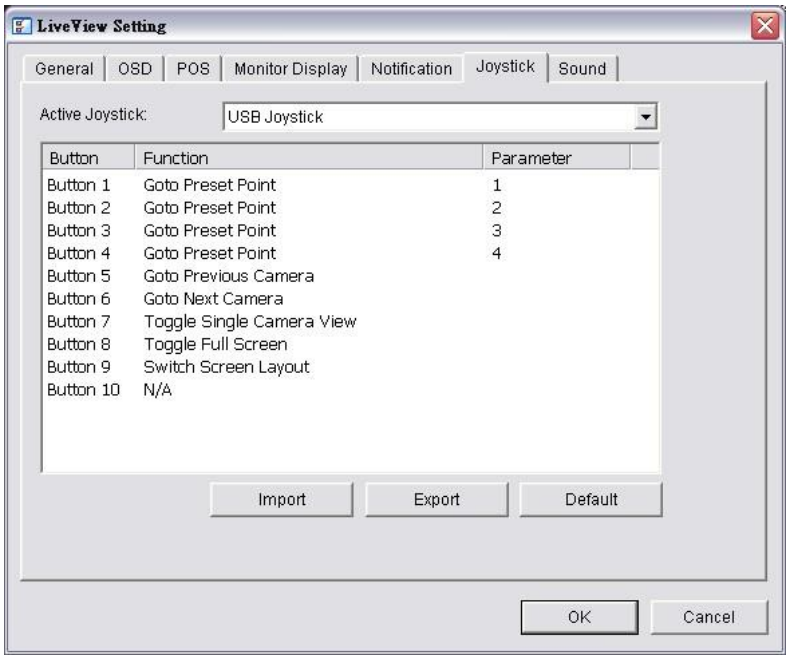
1. Open Internet Explorer and log in to the unit.
2. Click the **Live View** button on the top of the page.
3. Click the **General Setting** button.
4. Click the **Notification** tab.



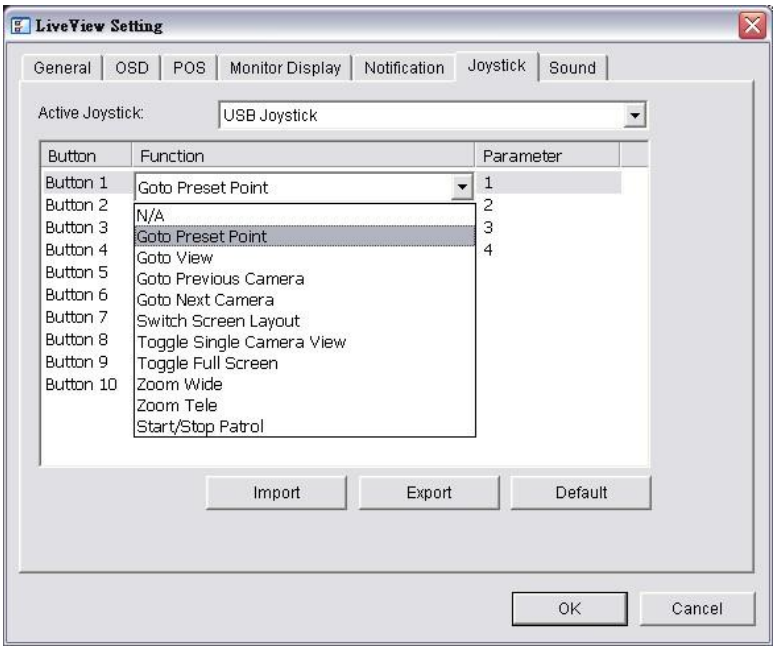
5. Check **Show recording status** to show the crystal ball with recording status on monitor display.
6. Check **Show camera event** to display the words of detected camera event on the correspondent screen.
7. Check **Popup system event** to pop up system event message dialog as a warning when a system event occurred.
8. Click the **OK** button.

4.1.7 Set up Joystick Control

1. Open Internet Explorer and log in to the unit.
2. Click the **Live View** button on the top of the page.
3. Click the **General Setting** button.
4. Click the **Joystick** tab.



- **Function**: You can choose the function from the drop-down menu for the button of the joystick.

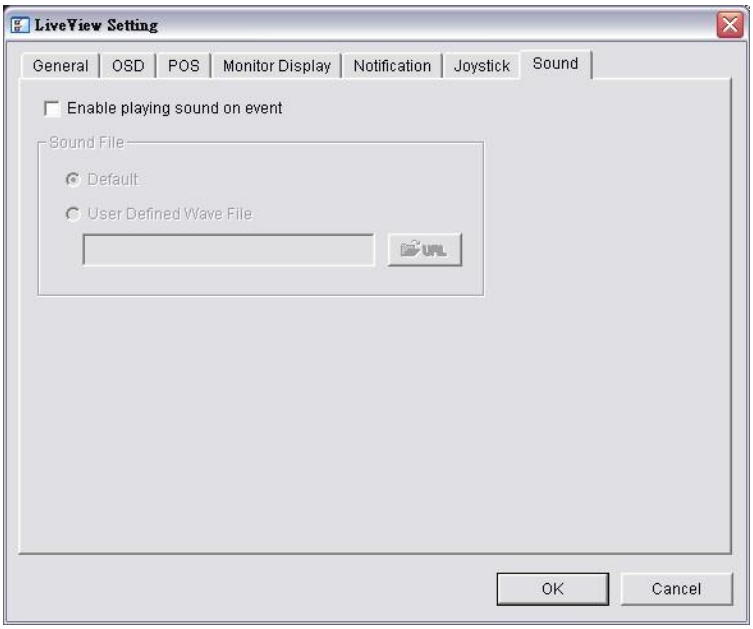


- **Parameter**: Choose the preset point from the drop-down menu.
- **Default**: Click to back to default setting.
- **Import**: Click to import the settings.
- **Export**: Click to export the settings.

5. Click the **OK** button.

4.1.8 Set up Live View Sound on Event

1. Open Internet Explorer and log in to the unit.
2. Click the **Live View** button on the top of the page.
3. Click the **General Setting** button.
4. Click the **Sound** tab.



5. Check the **Enable playing sound on event** option.
6. Select sound file, default sound or user defined sound (.wav).
7. Click the **OK** button.

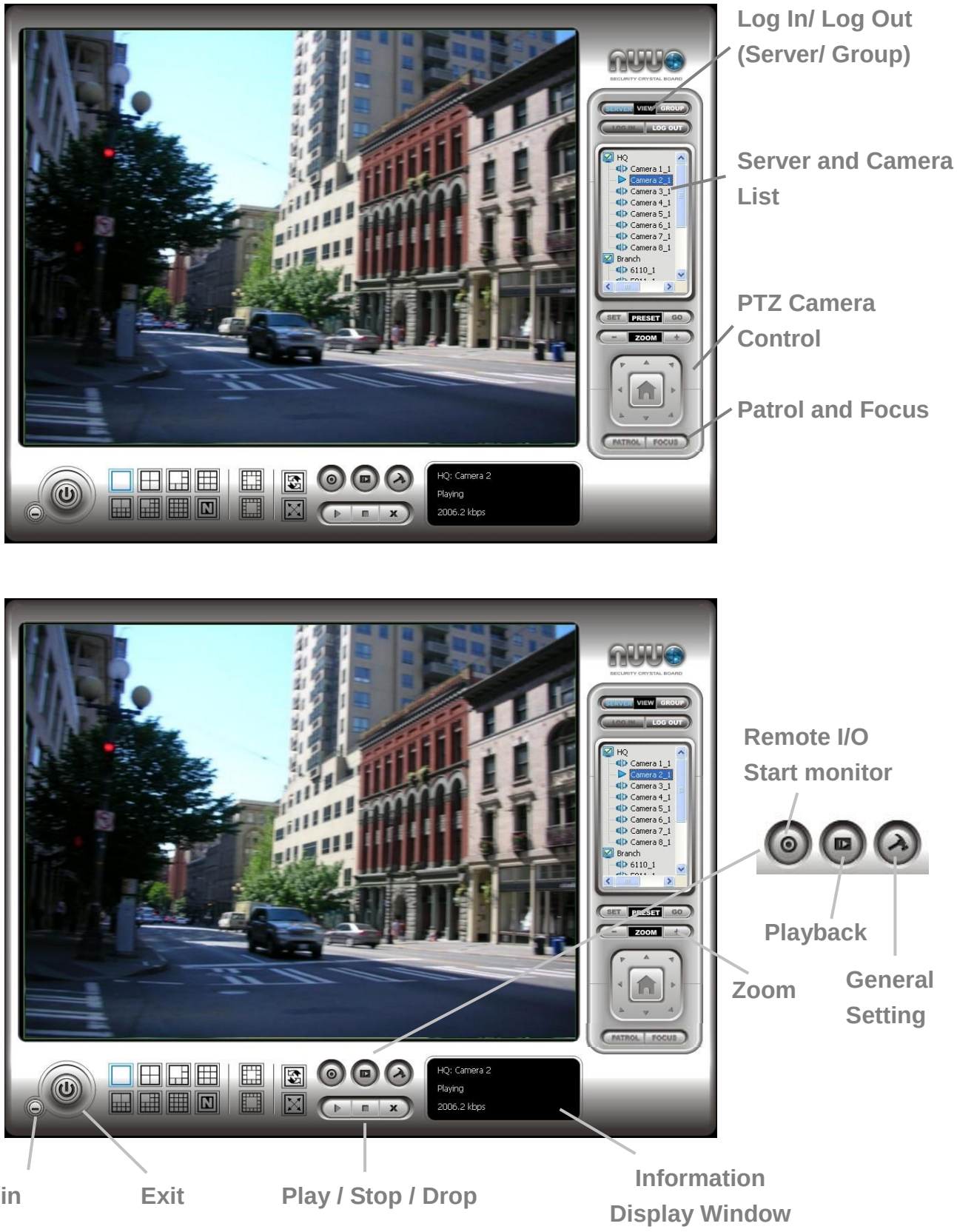
4.2 Remote Live Viewer Application

4.2.1 Remote Live Viewer Application Control Panel

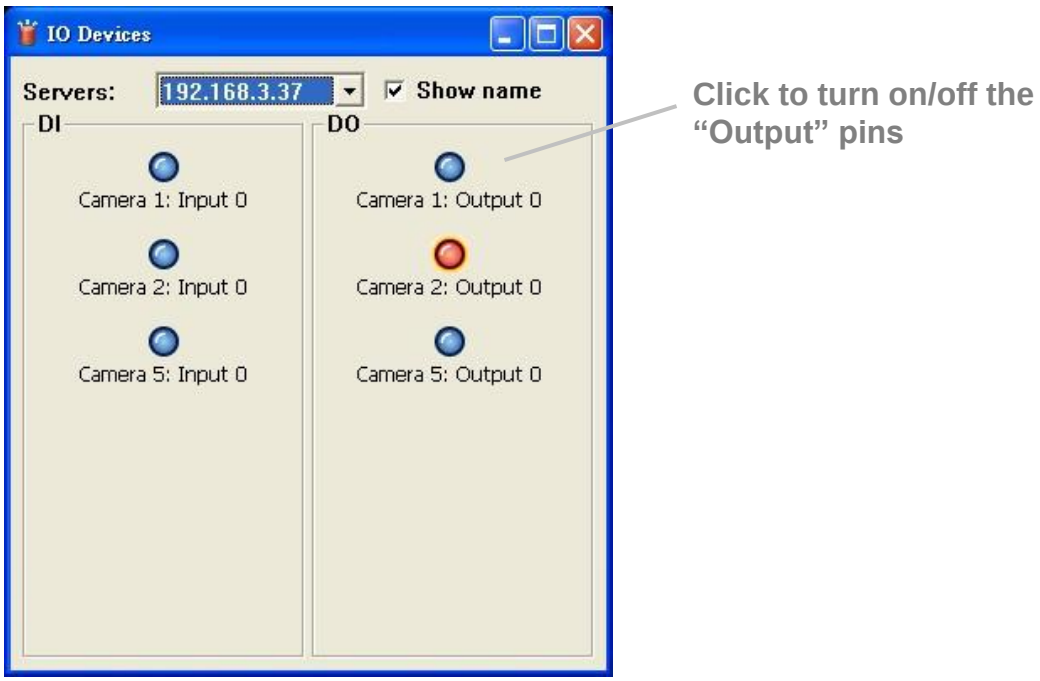
- **PTZ Camera Control**: You may control the camera view by using the PTZ camera control panel to adjust the camera's view. This is only

available with cameras that support the PTZ function.

- **Zoom**: Click the **+** or **–** button to zoom in or zoom out.



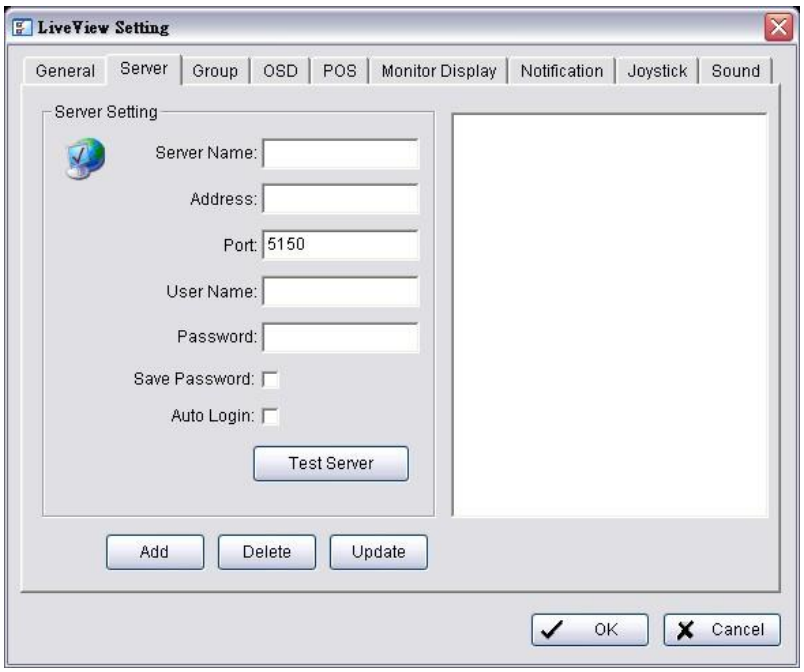
- **Minimize**: Minimize the Remote Live Viewer window.
- **Exit**: Shut down the application.
- **Play / Stop / Drop**: Select a camera/ video and click this button to play/stop/disconnect a particular channel.
- **Information Display Window**: Display video information including server name, video current status, and bit rate for a selected channel.
- **Start Monitor / Remote I/O**: Select Open Monitor to append monitor to view more live videos on multiple monitors. Utilize I/O device function remotely. - User can remotely adjust the Output Pins by turning it on or off.
- **Playback**: View playback video remotely.



4.2.2 Unit Connection Setting

1. Startup > NUUO NVRmini > Remote Live Viewer.
2. Click the **General Setting** button.

3. Insert the unit name.



4. Insert the IP address.
5. Modify the port if necessary.
6. Insert the user name.

7. Insert the password.
8. Check the **Save Password / Auto login** option.
9. Click the **Test Server** button to test the connection between the local application and the remote unit.
10. Click the **Add** button to add this unit into your remote server list.
11. Click the **OK** button.

4.2.3 General Setting

1. Startup > NUUO NVRmini > Remote Live Viewer.
2. Click the **General Setting** button.

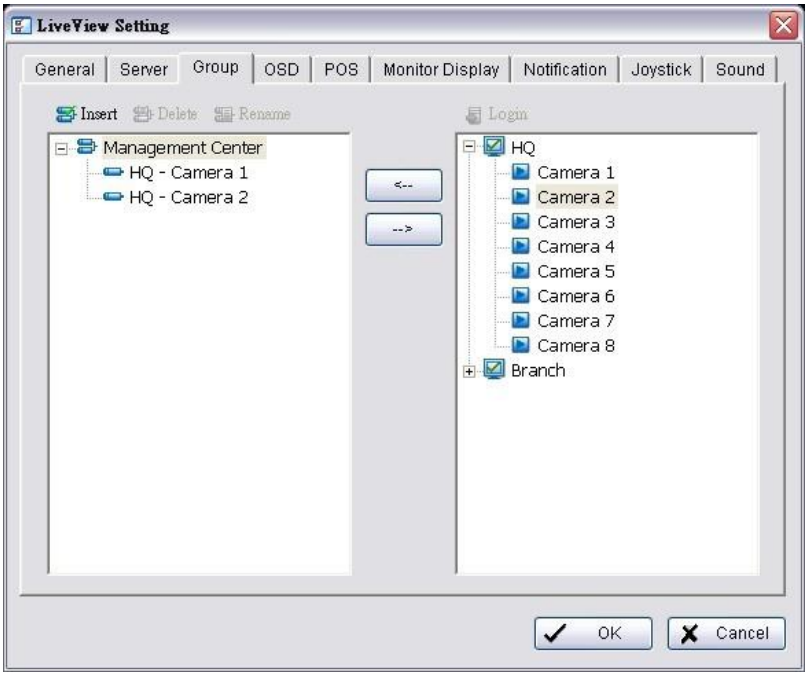
3. Click the **General** tab.

4. Check the **Enable audio on active channel** option to enable audio streaming on active channel. This function synchronizes with right click on camera to enable audio.
5. Check **Synchronize video frames** to avoid the tearing problem occurring in video display while increasing the CPU loading.
6. Select monitor(s) to run LiveView.
7. Click the **OK** button.

4.2.4 Camera Group Setting

You can put different cameras into the same group.

1. Startup > NUUO NVRmini > Remote Live Viewer.
2. Click the **General Setting** button.
3. Click the **Group** tab.



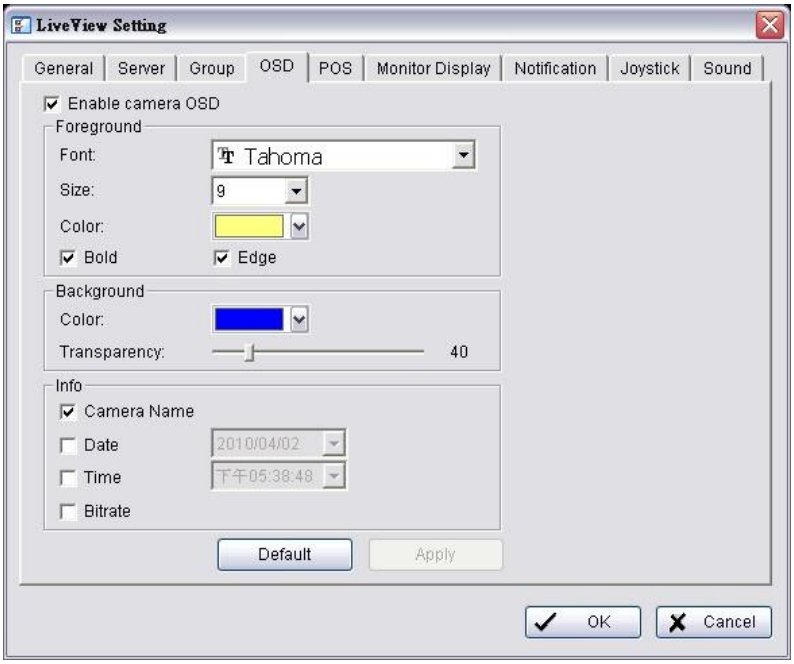
4. Log in to all the servers that contain the camera(s) you would like to put into the group(s).
5. Click the **Insert** button to create a new group.
6. Name this group.
7. Highlight the camera(s) that you would like to add into this group and then click the **<--** button.
8. Repeat step 6 to establish the group.
9. Repeat steps 3 through 7 to establish other groups.
10. Click the **OK** button.

4.2.5 Delete/ Rename Camera Groups

1. Startup > NUUO NVRmini > Remote Live Viewer.
2. Click the **General Setting** button.
3. Click the **Group** tab.
4. Click the group which you want to modify.
5. Click the **Delete** or **Rename** button to remove or rename that group.
6. Repeat steps 3 and 4 to modify other groups.
7. Click the **OK** button.

4.2.6 OSD (On-screen display) Setting

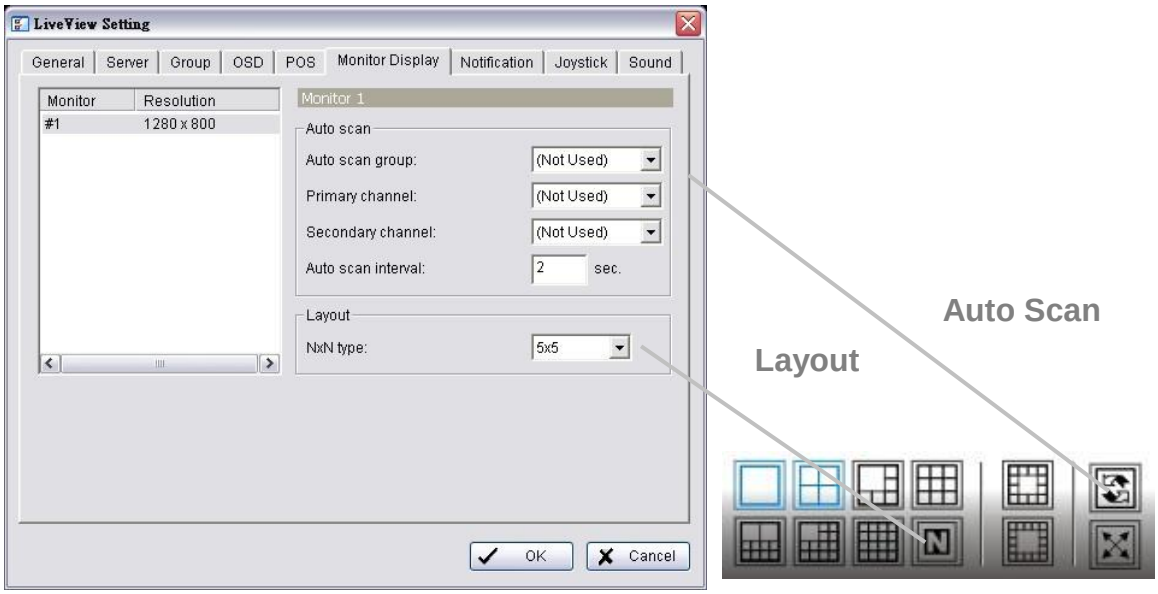
1. Startup > NUUO NVRmini > Remote Live Viewer.
2. Click the **General Setting** button.
3. Click the **OSD** tab.



4. Check the **Enable camera OSD** option.
5. Set the foreground and background settings of the OSD.
6. Select which kinds of information will be displayed on the screen.
7. Click the **Apply** button to preview the result.
8. Click the **Default** button to back to the default settings if necessary.
9. Click the **OK** button.

4.2.7 Monitor Display Setting

1. Startup > NUUO NVRmini > Remote Live Viewer.
2. Click the **General Setting** button.
3. Click the **Monitor Display** tab.



4. Select appointed server group to activate auto scan.
5. Select **Primary channel** which will always be on the screen when activating auto scan; while select **Secondary channel** which has second priority when activating auto scan. Enter the time interval for auto scan.
6. Select the screen division of NxN type.
7. Click the **OK** button.

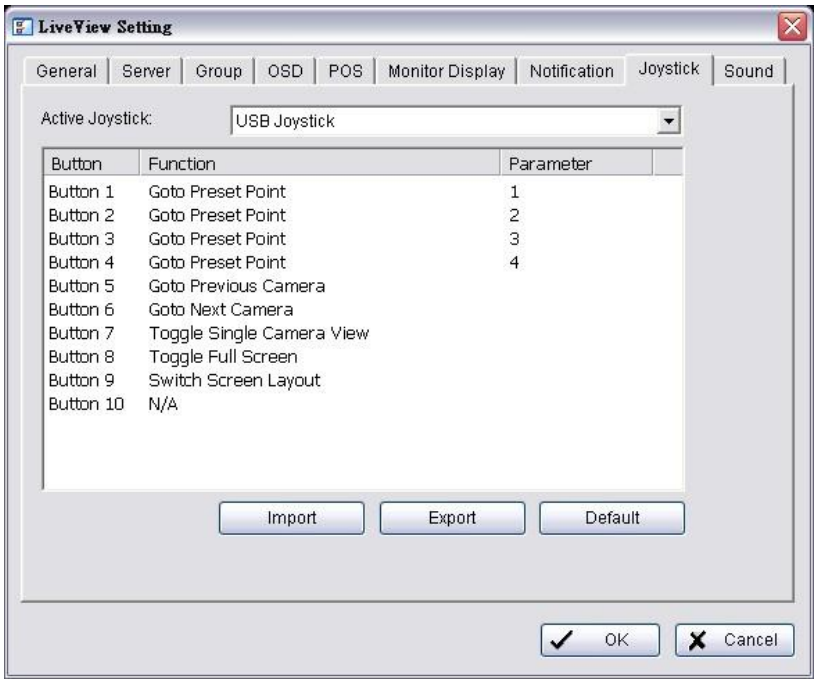
4.2.8 Notification

1. Startup > NUUO NVRmini > Remote Live Viewer.
2. Click the **General Setting** button.
3. Click the **Notification** tab.

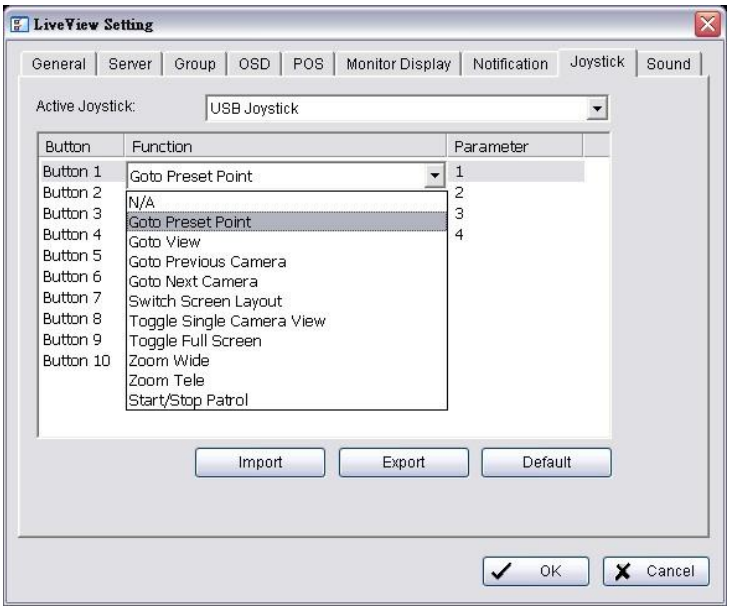
4. Check **Show recording status** to show the crystal ball with recording status on monitor display.
5. Check **Show camera event** to display the words of detected camera event on the correspondent screen.
6. Check **Popup system event** to pop up system event message dialog as a warning when a system event occurred.
7. Click the **OK** button.

4.2.9 Set up Joystick Control

1. Startup > NUUO NVRmini > Remote Live Viewer.
2. Click the **General Setting** button.
3. Click the **Joystick** tab.



- **Function**: You can choose the function from the drop-down menu for the button of the joystick.



- **Parameter**: Choose the preset point from the drop-down menu.
- **Default**: Click to back to default setting.
- **Import**: Click to import the settings.
- **Export**: Click to export the settings.

4. Click the **OK** button.

4.2.10 Set up Live View Sound on Event

1. Startup > NUUO NVRmini > Remote Live Viewer.
2. Click the **General Setting** button.
3. Click the **Sound** tab.

4. Check the **Enable playing sound on event** option.
5. Select sound file, default sound or user defined sound (.wav).
6. Click the **OK** button.

4.2.11 Set up Remote Live Viewer

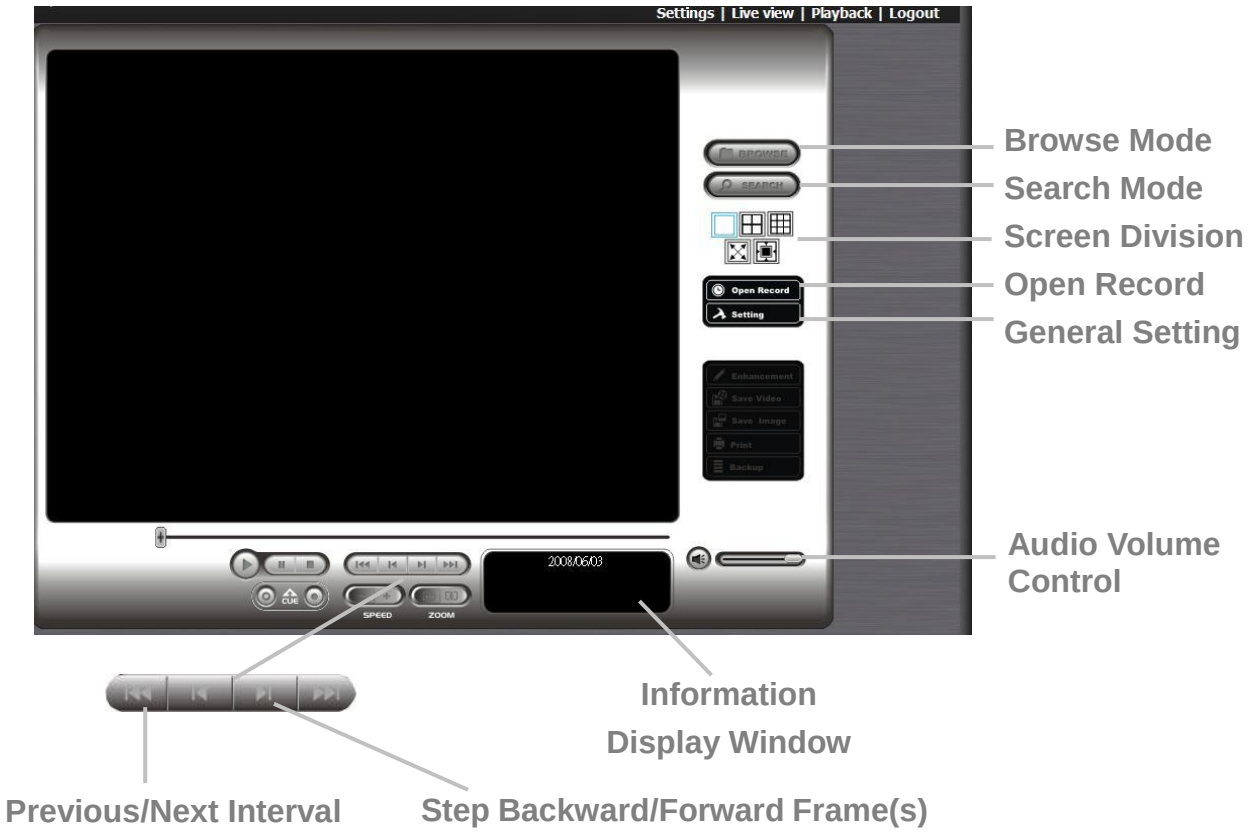
1. Startup > NUUO NVRmini > Remote Live Viewer.
2. Click the unit you wish to access in your remote server list.
3. Click the **LOG IN** button to access your unit.
4. Select a camera(s) from the camera list on the right and then drag it to where you wish the image to be displayed.

5. Playback

There are two ways to implement the playback function: with Internet Explorer or with the **Playback System** application.

5.1 Internet Explorer

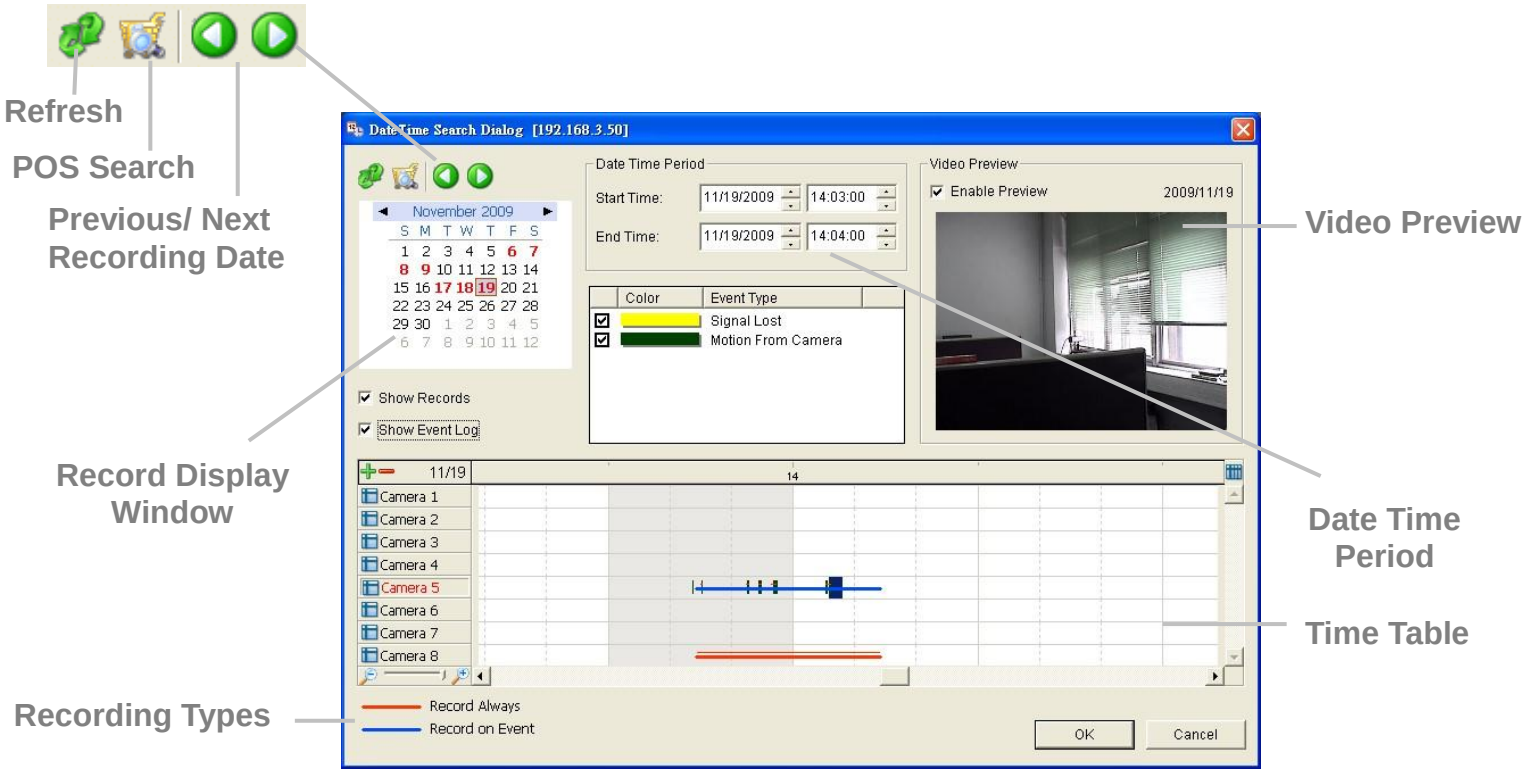
5.1.1 Playback Control Panel



- **Information Display Window**: Displays video date and time, cue-in / cue-out point times, and speed.
- **Audio Volume Control**: Adjust the sound level.
- **Screen Division**: Allocate the sub-screen display by clicking on the desired layout icon. To switch to single camera display, double click a particular sub-screen. Double click the screen again to regain previous screen division layout.
- **Browse Mode**: Play the recorded video when in Search Mode.
- **Open Record**: Click the **Open Record** button to access the Date-Time Panel and select the video records which you want to review.

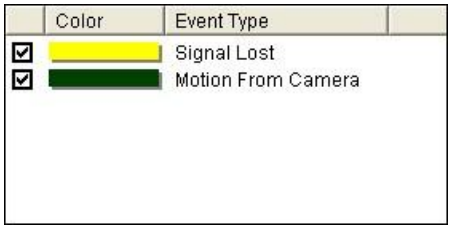
- **General Setting**
  - Record Display
    - Calendar View: view the Record Display Window as a calendar.
    - List Control: view the Record Display Window as a list control.
  - Play
    - Play when open: check this option to set the system to start playing the video clip every time a record is withdrawn.
    - Auto-skip when recording in motion-only mode: check this option to set up the system to automatically skip to the points where there were motions recorded.
    - Next interval: set the interval with which the video goes forward when you click the **Next** button on the control panel.
    - Previous interval: set the interval with which the video goes backward when you click the **Previous** button on the control panel.
  - Capture Image
    - Save in clipboard: the image will be saved in the clipboard and can be pasted to other application software.
    - Manually save the image file: you can manually select where you want to save the image, name the saved file, and choose the format you want to save the image.
    - Automatically save the image file: by presetting a path/URL and the image format, the system will automatically save the image accordingly when you click the **Save Image** button on the control panel.

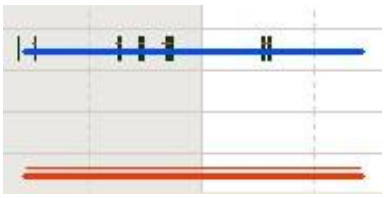
5.1.2 Search the Recorded Video



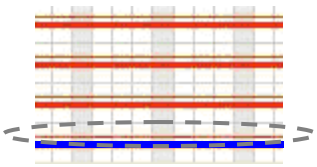
- : refresh the Record Display Window.
- or : go to previous or next recording date.
- **Record Display Window**: Display the available recorded video records.
- **Date Time Period**: Select the start and end time points that indicate the time period you would like to view after choosing cameras.
- **Video Preview**: Check the **Enable Preview** option to view the selected video.
- **Time Table** (preset recording schedule): Click the icon to select all channels; click the icon to deselect all channels. Finally, use the scale bar to modify the scale of the time table.

  There are two recording modes: ***Record Always*** and ***Record on Event.*** The Time Table will display these two modes in different colors.
- **Show Records**: Show the period of recording data in the Time Table.
- **Show Event Log**: Show Event Log makes Time Table show the time of event detection. Color of event type can be defined by preference.





1. From the Record Display Window at the top left of the Date Time Panel, select the date you want to search the record from. The red lines shown on the time table indicate available recorded video records.



2. Use color bars to differentiate recording types from each other. This will help you select video clips.
3. Highlight the video clip you want to review by left-clicking and dragging the time period. You may also utilize the Start Time and End Time in Date Time Period Section after choosing camera. In addition, modify the scale of the time table with the or icon on the bottom left.
4. Check the **Enable Preview** option to get the preview of the video you select.
5. Click the camera name to increase or decrease cameras you want to playback.
6. Click the **OK** button.

Note

The Record Display Window can be shown in (a) calendar view or (b) list control view. To modify the settings of the record display window, click the **General Setting** button at the right of the page.

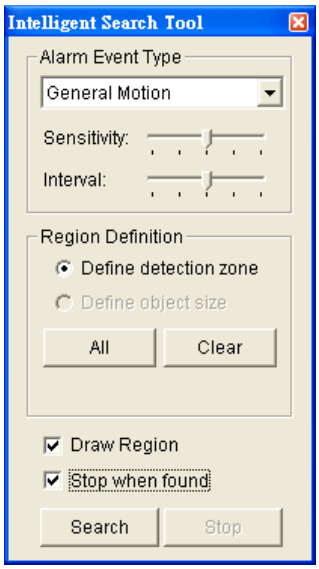
5.1.3 Play the Recorded Video

1. Be sure that you have set the schedule / recording event first.
2. Open Internet Explorer and log in to the unit.
3. Click the **Playback** button on the top of the page.
4. Click the **Open Record** button.
5. The Record Display Window will show the information of the available video clips. Select the date you want to search the record from.
6. Highlight the video records that you want to review.
7. Click the **OK** button.

5.1.4 Intelligent Search

After opening the recorded video, click the **Search Mode** button to obtain the Intelligent Search Tool panel. You can search for unusual events during the recording period.

There are 5 types of unusual events: ***General Motion***, ***Foreign Object***, ***Missing Object***, ***Focus Lost***, and ***Camera Occlusion***.



- **General Motion**: Detect all movements in the defined area.

1. Define detection zone by dragging to draw a detection zone. You may define more than one zone by repeating this step.
2. Modify the sensitivity setting by changing the slider control. Moving toward the right will increase the sensitivity level, which means a relatively small movement will trigger the alarm.
3. Set the interval. Moving toward right will increase time interval so that the alarm will only be triggered when the movement lasts longer.
4. Check the **Stop when found** option. If unchecked, the search tool will list all the events it found, instead of stopping at the moment the event found.
5. Click the **Search** button.

- **Foreign Object**: Alarm is set on when any additional object appears in the defined area on the screen.

1. Define detection zone by dragging to draw a detection zone.
2. Modify the sensitivity setting.
3. Set the Interval.
4. Check the **Stop when found** option. If unchecked, the search tool will list all the events it found, instead of stopping at the moment the event found.
5. Click the **Search** button.

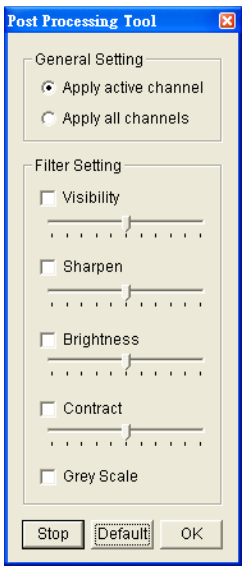
- **Missing Object**: Alarm is set on when the selected object is removed from the defined area on the screen.

1. Define detection object by dragging to draw a detection zone.
2. Modify the sensitivity setting.
3. Set the Interval.
4. Check the **Stop when found** option. If unchecked, the search tool will list all the events it found, instead of stopping at the moment the event found.
5. Click the **Search** button.

- **Focus Lost**: System will inform you when the camera(s) lose its focus.
- **Camera Occlusion**: Alarms when the camera is blocked.

5.1.5 Recorded Video Enhancement

1. Open Internet Explorer and log in to the unit.
2. Click the **Playback** button on the top of the page.
3. Click the **Open Record** button.
4. The Record Display Window will show the information of the available video clips. Select the date you want to search the record from.
5. Highlight the video clip you want to review, and then click the **OK** button.
6. Click the **Enhancement** button.
7. Check the General Setting.



- **Apply active channel**: The settings will only be applied to the selected channel.
- **Apply all channels:** The settings will be applied to those currently shown on the screen.

8. Set the Filter Setting.

- **Visibility**: Check the option and adjust the gamma value of the image to enhance the image and make it cleaner.
- **Sharpen**: Check the option to activate the function. Move the slider

control to the right to sharpen the image, to the left to soften it.

- **Brightness**: Check the option to activate the function. Move the slider control to the right to make the image brighter.
- **Contrast**: Check the option to activate the function. Move the slider control to the right to increase contrast.
- **Grey Scale**: Check the option to show the record in gray-scale mode so the image displays in black and white.

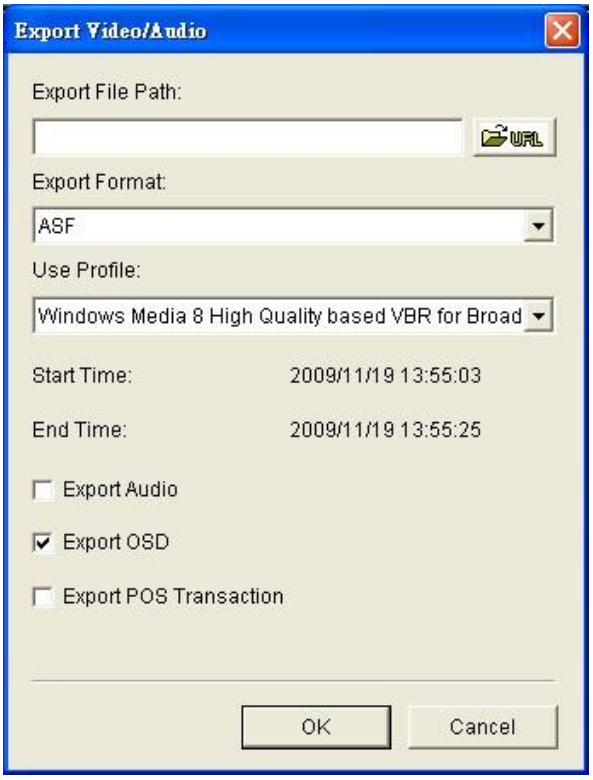
9. Click the **OK** button.

- **Stop**: Stop the enhancement function and close the enhancement tool. (The system will automatically back to the default settings.)
- **Default**: Back to the default settings, however, the enhancement tool still works.
- **OK**: Apply the modifications of the settings.

5.1.6 Save a Video

1. Open Internet Explorer and log in to the unit.
2. Click the **Playback** button on the top of the page.
3. Click the **Open Record** button.
4. The Record Display Window will show the information of the available video clips. Select the date you want to search the record from.
5. Highlight the video clip you want to review, and then click the **OK** button.
6. Choose the camera display that you want to save as a video clip.
7. Set up the cue in and cue out points; the cue in and cue out time will be shown on the information window.

8. Click the **Save Video** button.



9. Choose the folder where you want to save the file.
10. Insert the file name and click the **Save** button.
11. Choose the export format.
12. Choose the use profile.
13. Check to export the recorded video with Audio, OSD and POS Transaction.
14. Click the **OK** button.

Note

We recommend that you export to the .asf format when saving video. In exporting to the .avi format, the frame rate will be increased when playing in the video player, causing the video to run faster than normal.

5.1.7 Save an Image

1. Open Internet Explorer and log in to the unit.

2. Click the **Playback** button on the top of the page.
3. Click the **Open Record** button.
4. The Record Display Window will show the information of the available video clips. Select the date you want to search the record from.
5. Highlight the video clip you want to review, and then click the **OK** button.
6. Choose the camera display that you want to save pictures.
7. Click the **Save Image** button when the image you want is shown on the screen.
8. Choose the folder where you want to save the file at.
9. Choose the folder and the image format (BMP or JPEG) you prefer.
10. Insert the file name.
11. Click the **Save** button.

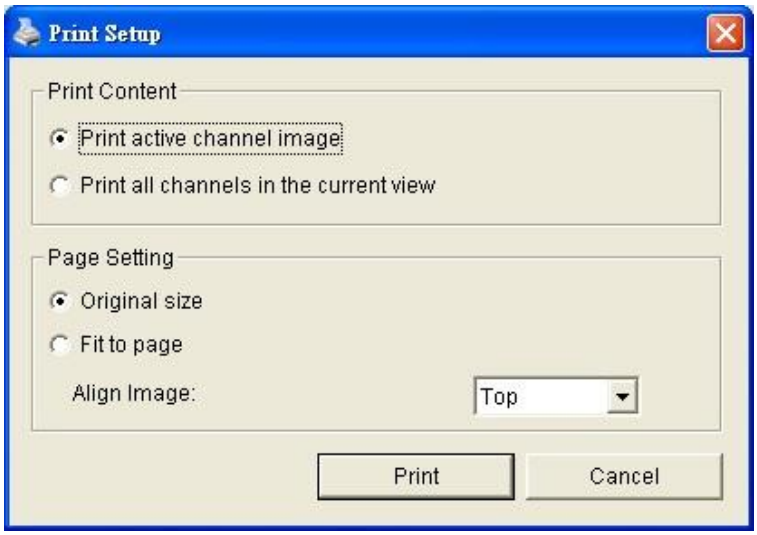
Note

You may skip step 3 by presetting the folder where you want to save the images and the format you want to save them in.

5.1.8 Print an Image

Print the current image of the video you choose.

1. Open Internet Explorer and log in to the unit.
2. Click the **Playback** button on the top of the page.
3. Click the **Open Record** button.
4. The Record Display Window will show the information of the available video clips. Select the date you want to search the record from.
5. Highlight the video clip you want to review, and then click the **OK** button.
6. Choose the camera display from which you want to print pictures.
7. Click the **Print** button when the image you want is shown on the screen.
8. Set print settings.



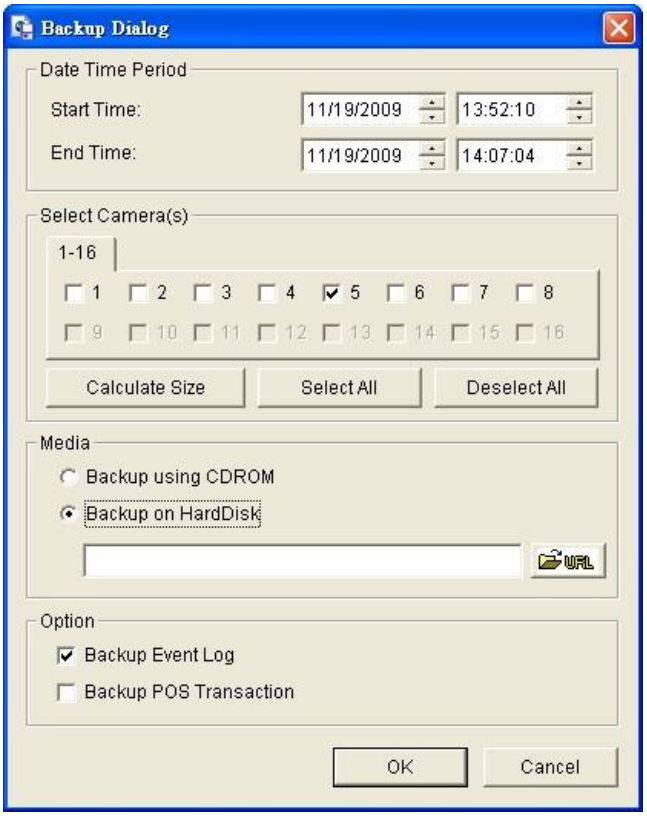
- **Print Content**: Print the image from currently selected channel or all the channels shown on the screen.
- **Page Setting**
  - Print in original size: Check to have the image print in original size.
  - Fit the page: Check to have the image fit the page.
  - Align Image: Top, center, or bottom

9. Click the **Print** button.

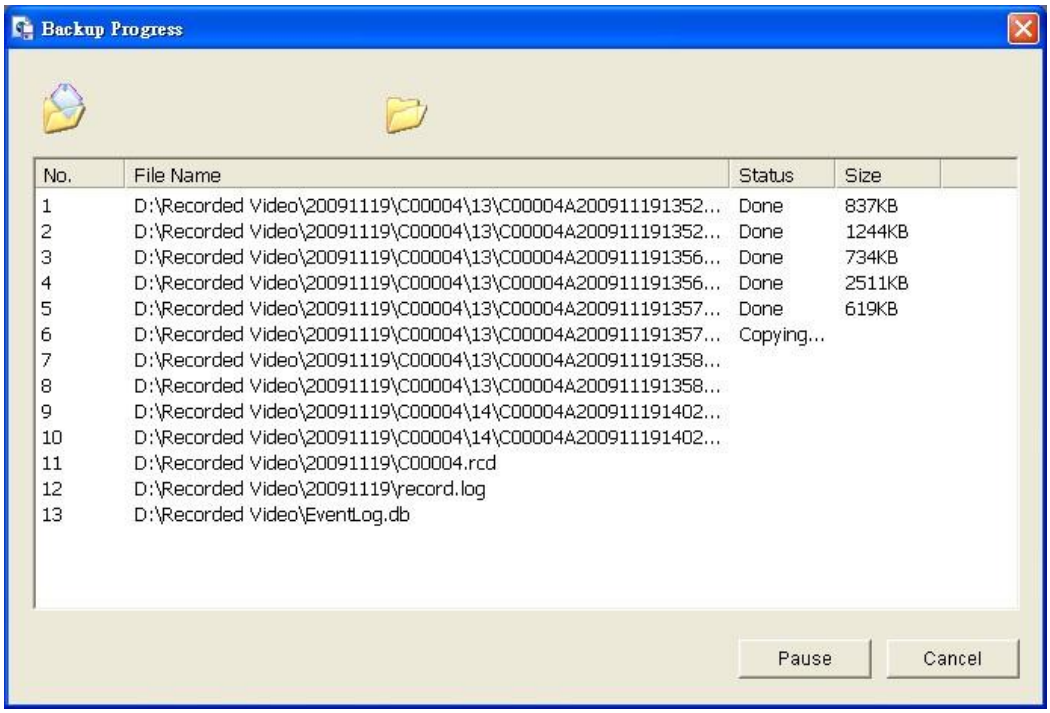
5.1.9 Backup the Recorded Video

Different from Save Video, the Backup function will save all the recorded videos which belong to the time slot you set, instead of the clips.

10. Open Internet Explorer and log in to the unit.
11. Click the **Open Record** button to select data.
12. Click the **Backup** button.



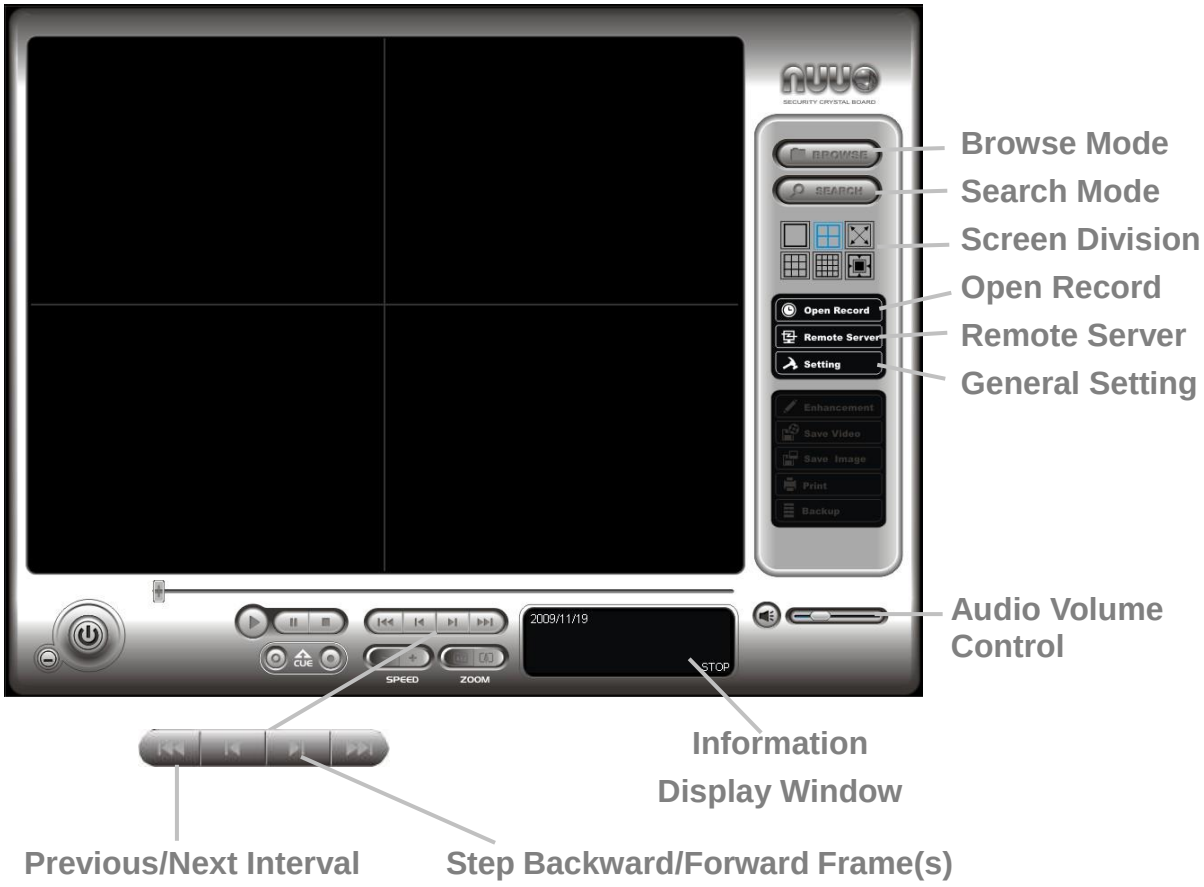
13. Set the Start Time and End Time you want to backup.
14. Select the cameras you want to backup.
15. Select the directory you want to save the backup data.
16. Click the **Backup** button.
17. The system will then begin backup process automatically.



5.2 Remote Playback System Application

5.2.1 Playback System Application Control Panel

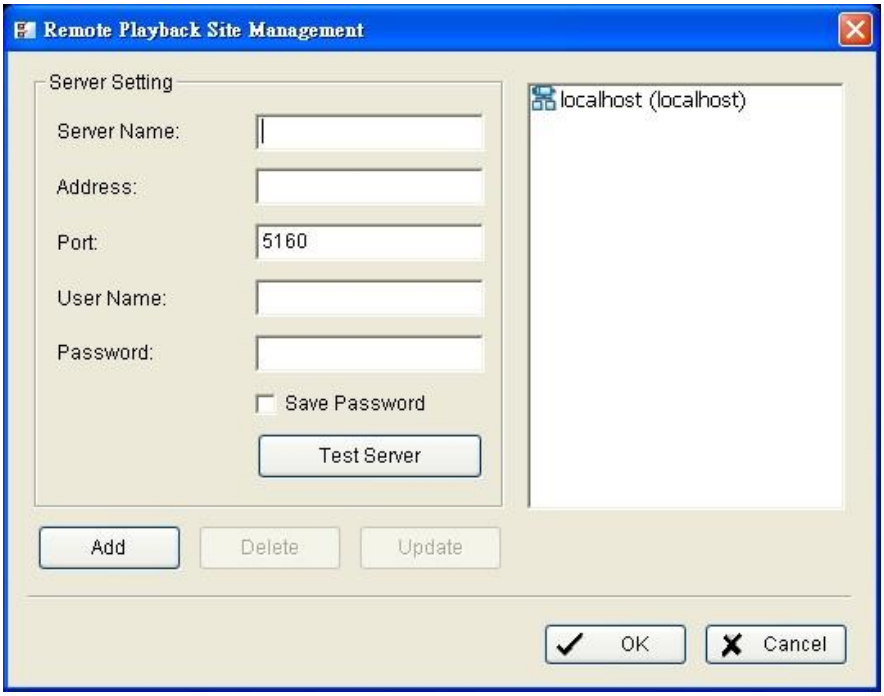
The **Playback System** control panel is similar to the playback panel in Internet Explorer. See **5.1.1 Playback Control Panel** for more details about those buttons.



5.2.2 Set up Unit Connections

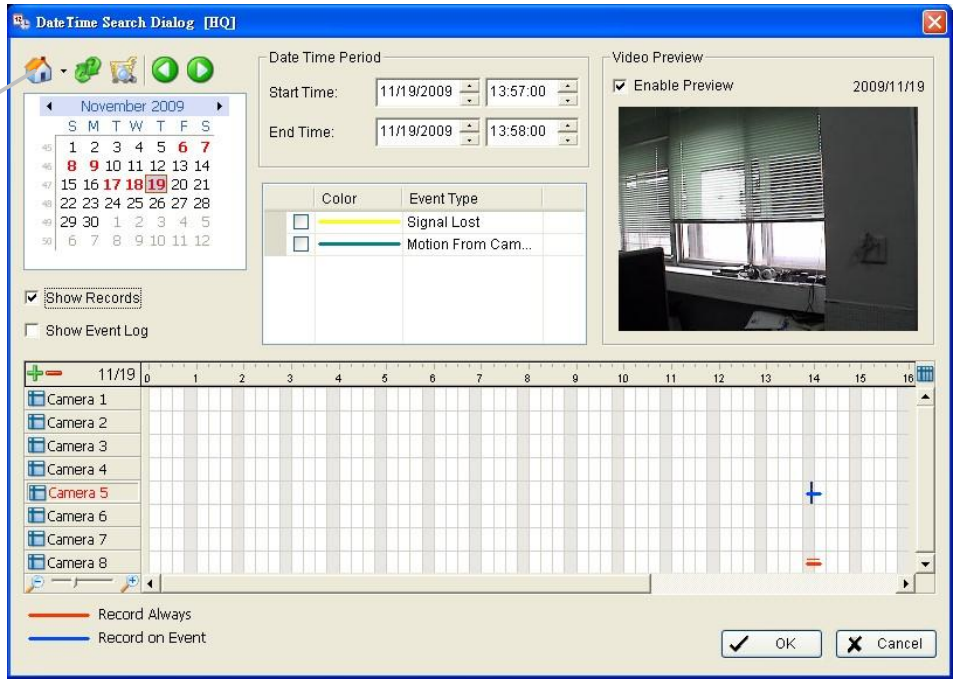
Before using the **Playback System** application, you need to set a connection to your unit first.

1. Startup > NUUO NVRmini > Playback System.
2. Click the **Remote Server** button.



3. Insert the name of your unit.
4. Insert the IP address of that unit.
5. Modify the port if necessary.
6. Insert the user name.
7. Insert the password.
8. Check the **Save Password** option.
9. Click the **Test Server** button to test the connection between the local application and the remote unit.
10. Click the **Add** button to add this unit into the remote server list.
11. Click the **OK** button.

5.2.3 Search the Recorded Video



1. Startup > NUUO NVRmini > Playback System.
2. Click the **Open Record** button.
3. Click the icon on the top of the Date-Time Panel to obtain the Remote Playback Site Management dialog, and then select the server you want to access.
4. Highlight the records you want to view in the Time Table.
5. Set the Date Time Period.

The search process in the **Playback System** application is similar to that of Internet Explorer. See **5.1.2 Search the Recorded Video** for more details about the setting process.

5.2.4 Play the Recorded Video

1. Be sure that you have set up the recording schedule / response first.
2. Startup > NUUO NVRmini > Playback System.
3. Click the **Remote Server** button to set connections to your unit. See **5.2.2 Set up Unit Connections** for more details.
4. Click the **Open Record** button.
5. The Record Display Window will show the information of the available

video clips. Select the date you want to search the record from. See **5.1.2 Search the Recorded Video** for more details.

6. Highlight the video records that you want to review.
7. Select the start and end points in Date Time Period to adjust the time slot.
8. Click the **OK** button.

5.2.5 Intelligent Search

1. Startup > NUUO NVRmini > Playback System.
2. Click the **Open Record** button.
3. The Record Display Window will show the information of the available video clips. Select the date you want to search the record from. See **5.1.2 Search the Recorded Video** for more details.
4. Highlight the video records that you want to review.
5. Choose the camera display for which you want to implement smart search.
6. Click the **Search Mode** button to open the Intelligent Search Tool panel.
7. Set up unusual events here to detect abnormalities occurring during the recoding period. See **5.1.4 Intelligent Search** for more details.
8. The searched events will be listed. Click to find that event.

There are 5 types of unusual events: ***General Motion***, ***Foreign Object***, ***Missing Object***, ***Focus Lost***, and ***Camera Occlusion***.

- **General Motion**: Detect all movements in the defined area.
- **Foreign Object**: Alarm when any additional object appears in the defined area on the screen.
- **Missing Object**: Alarm when the selected object is removed from the defined area on the screen.
- **Focus Lost**: System will inform you when the camera(s) lose focus.
- **Camera Occlusion**: Alarm when the camera is blocked.

The intelligent search in the **Playback System** application is similar to that of Internet Explorer.

5.2.6 Recorded Video Enhancement

1. Startup > NUUO NVRmini > Playback System.
2. Click the **Open Record** button.
3. The Record Display Window will show the information of the available video clips. Select the date you want to search the record from. See **5.1.2 Search the Recorded Video** for more details.
4. Highlight the video records that you want to review.
5. Choose the camera display that you want to implement video enhancement.
6. Click the **Enhancement** button.
7. Check the General Setting.

- **Apply active channel**: The settings will only be applied to the selected channel.
- **Apply all channels:** The settings will be applied to those currently shown on the screen.

8. Set the Filter Setting.

- **Visibility**: Check the option and adjust the gamma value of the image to enhance the image and make it cleaner.
- **Sharpen**: Check the option to activate the function. Move the slider control to the right to sharpen the image, to the left to soften it.
- **Brightness**: Check the option to activate the function. Move the slider control to the right to make the image brighter.
- **Contrast**: Check the option to activate the function. Move the slider control to the right to increase contrast.
- **Grey Scale**: Check the option to show the record in gray-scale mode so the image displays in black and white.

9. Click the **OK** button.

- **Stop**: Stop the enhancement function and close the enhancement tool. (The system will automatically revert back to the default settings.)
- **Default**: Back to the default settings, however, the enhancement tool still works.

- **OK**: Apply the modifications of the settings.

5.2.7 Save a Video

1. Startup > NUUO NVRmini > Playback System.
2. Click the **Open Record** button.
3. The Record Display Window will show the information of the available video clips. Select the date from which you want to search the record. See **5.1.2 Search the Recorded Video** for more details.
4. Highlight the video records that you want to review.
5. Choose the camera display that you want to save as a video clip.
6. Set up the cue in and cue out points; the cue in and cue out time will show on the information window.

7. Click the **Save Video** button.
8. Choose the folder where you want to save the file.
9. Insert the file name and click the **Save** button.
10. Choose the export format.
11. Choose the use profile.
12. Check the **Export Audio** option.
13. Click the **OK** button.

5.2.8 Save an Image

1. Startup > NUUO NVRmini > Playback System.
2. Click the **Open Record** button.
3. The Record Display Window will show the information of the available video clips. Select the date from which you want to search the record.. See **5.1.2 Search the Recorded Video** for more details.
4. Highlight the video records that you want to review.
5. Choose the camera display from which you want to save pictures.
6. Click the **Save Image** button when the image you want is shown on the screen.

7. Choose the folder where you want to save the file at.
8. Choose the format of image (BMP or JPEG) you prefer.
9. Insert the file name.
10. Click the **Save** button.

Note

You may skip step 7 by presetting a folder where you want to save the images and a format which you want to save the images in.

5.2.9 Print an Image

Print the current image of the video you choose.

1. Startup > NUUO NVRmini > Playback System.
2. Click the **Open Record** button.
3. The Record Display Window will show the information of the available video clips. Select the date you want to search the record from. See **5.1.2 Search the Recorded Video** for more details.
4. Highlight the video records that you want to review.
5. Choose the camera display that you want to print pictures.
6. Click the **Print** button.
7. Set the print settings.

- **Print Content**: Print the image from currently selected channel or all the channels shown on the screen.
- **Page Setting**
  - Print in original size: Select to have the image print in original size.
  - Fit the page: Select to have the image fit the page.
  - Align Image: Top, center, or bottom

5.2.10 Backup the Recorded Video

Different from Save Video, the Backup function will save all the recorded videos which belong to the time slot you set, instead of the clips.

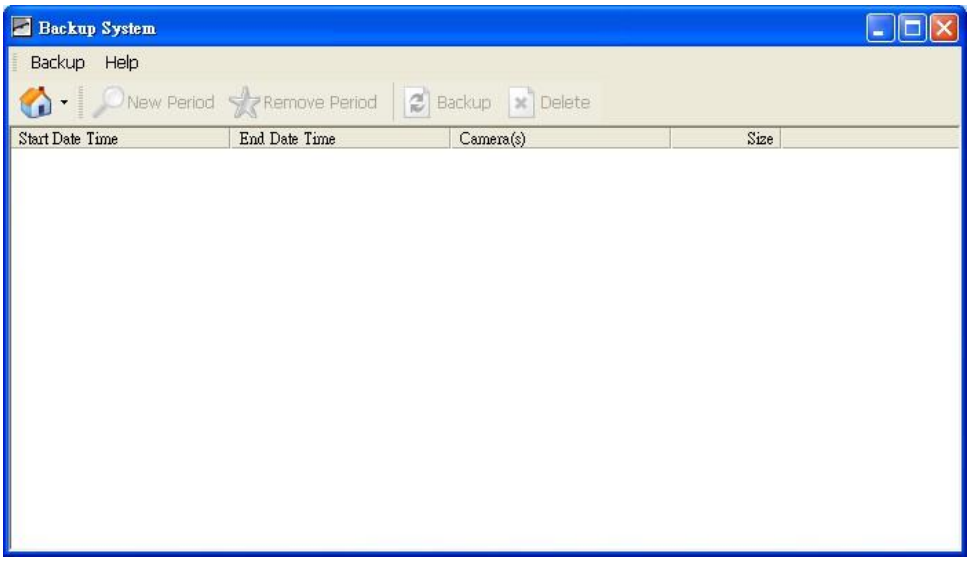
1. Startup > NUUO NVRmini > Playback System.
2. Click the **Open Record** button to select data.
3. Click the **Backup** button.
4. Set the Start Time and End Time you want to backup.
5. Select the cameras you want to backup.
6. Select the directory you want to save the backup data.
7. Click the **Backup** button.

6. Backup and Delete Records

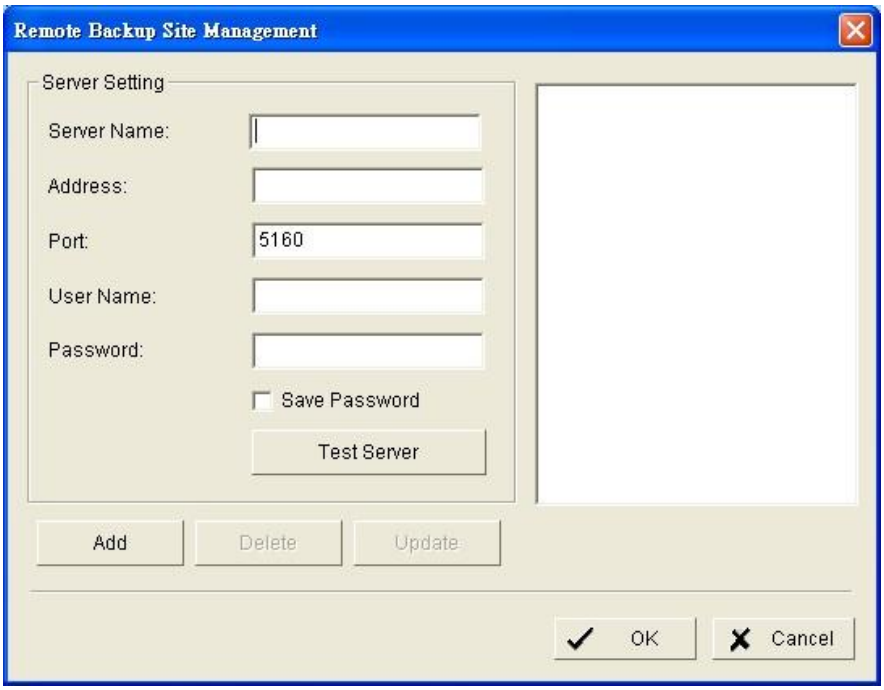
6.1 The Backup System Application

In addition to the ways mentioned in the previous chapters, you can apply the application to backup your files.

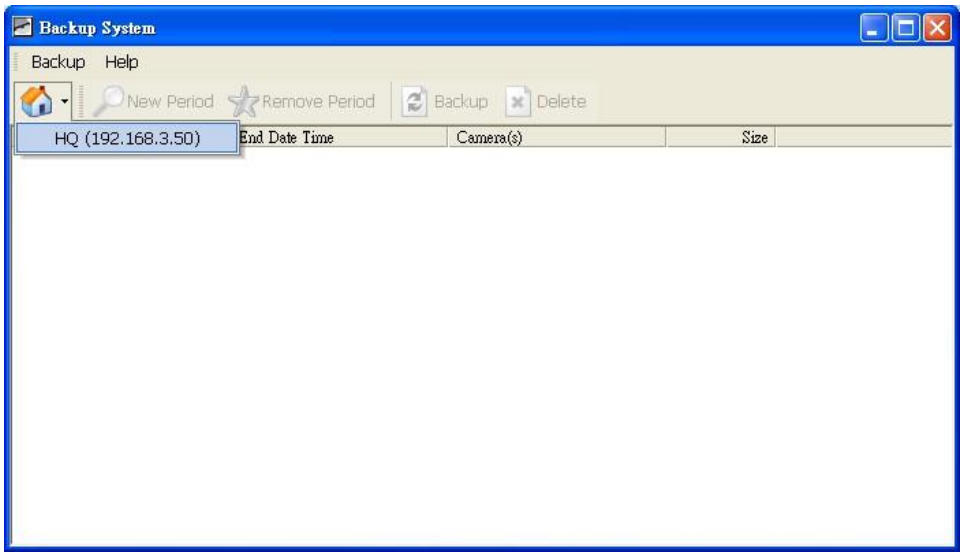
1. Startup > NUUO NVRmini > Backup System.



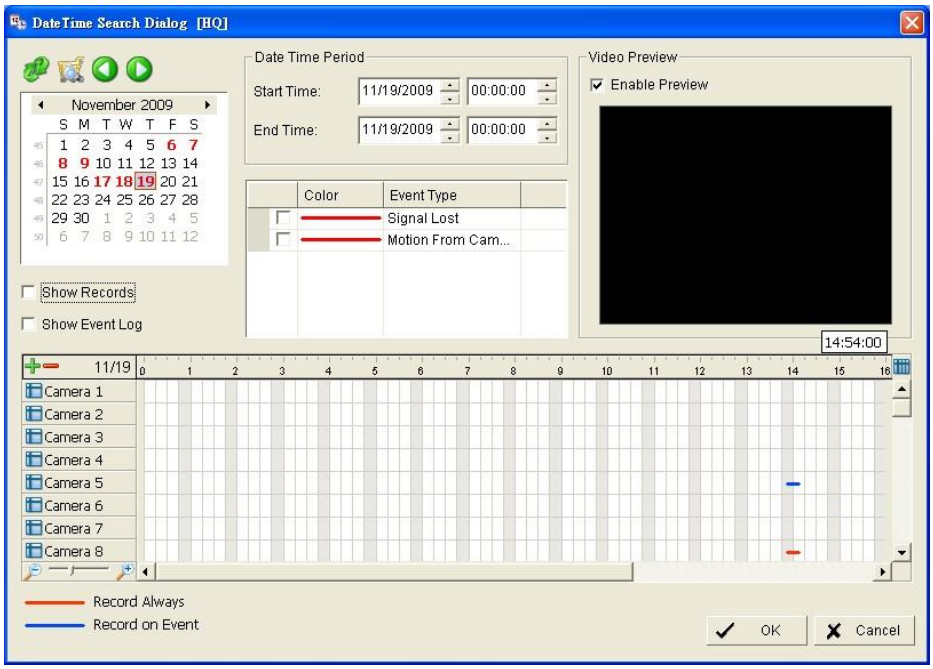
2. Click the **Remote Server Site** button to set up remote server.



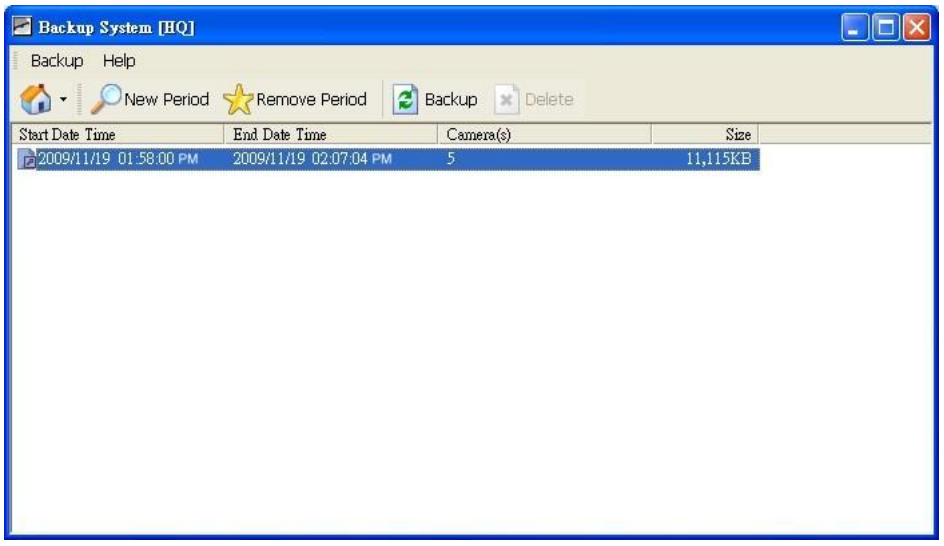
3. Insert the name of your unit.
4. Insert the IP address of that unit.
5. Modify the port if necessary.
6. Insert the user name.
7. Insert the password.
8. Check the **Save Password** option.
9. Click the **Test Server** button to test the connection between the local application and the remote unit.
10. Click the **Add** button to add this unit into the remote server list.
11. Click the **OK** button.
12. Click the ▼ button next to **Remote Server Site** button, and select one of servers you added.



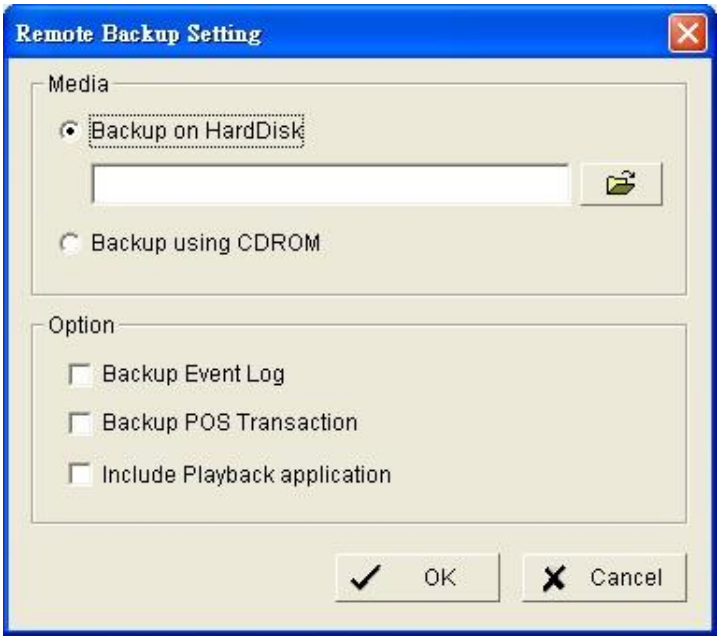
13. Click the **New Period** button to select the record date.



14. Set the Start Time and End Time you want to backup. (or highlight the video records which you want to backup)
15. Select the cameras you want to backup.
16. Click the **OK** button.
17. Select the time slot which you want to backup.



18. Click the **Backup** button.
19. Select the way and directory you want to save the backup data.
20. Check the **Include Playback application** option, which will add **Playback** application into the backup folder.



21. Click the **OK** button.

6.2 Backup the Recorded Video through Windows Explorer

1. Find your unit through Windows Explorer (insert “\\” plus the IP address of your unit)
2. Insert the name and password of the administrator or power user.
3. Open the “videodata” folder.
4. Copy the date folder which you want to backup to your desktop / laptop.

6.3 Backup the Recorded Video through FTP

1. Find your unit through Windows Explorer (insert “ftp://” plus the IP address of your unit)
2. Insert the name and password of the administrator or power user.
3. Open the “videodata” folder.
4. Copy the date folder which you want to backup to you desktop / laptop.

6.4 Playback the Backup Records

6.4.1 With Playback Application

1. Use the Backup System application to backup your records.
2. Check the **Include Playback application** option, which will add the **Playback** application into the backup folder.
3. Open that folder.
4. Double-click the Playback application icon.
5. Select the recorded data to play back.

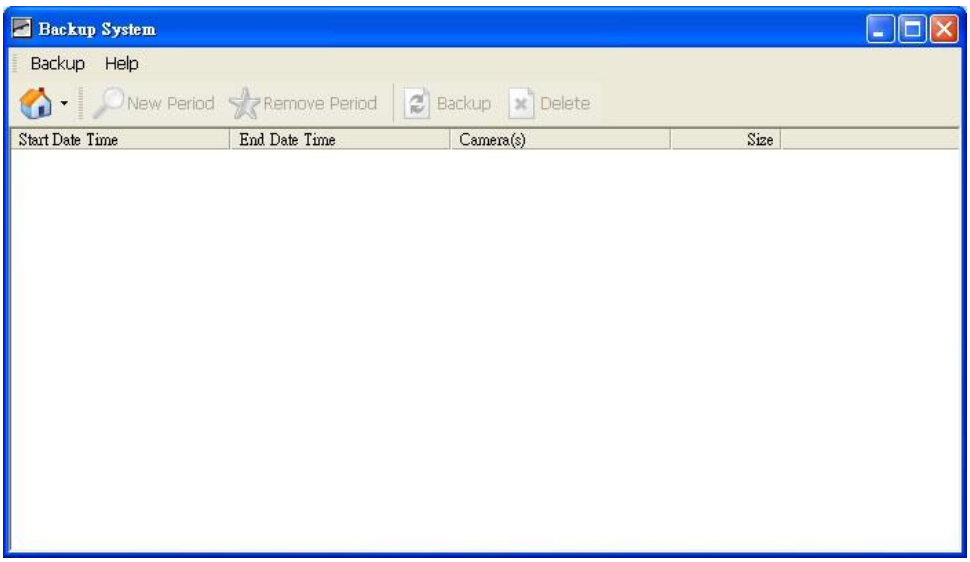
6.4.2 Without Playback Application

1. Use the Playback function to backup your records.
2. Put your backup folder into the program folder of NVRmini. (Default directory is “C:\Program Files\NUUO\NVRmini”.)
3. Startup > NUUO NVRmini > Playback System.
4. Click the **Open Record** button.
5. Select the recorded data to play back.

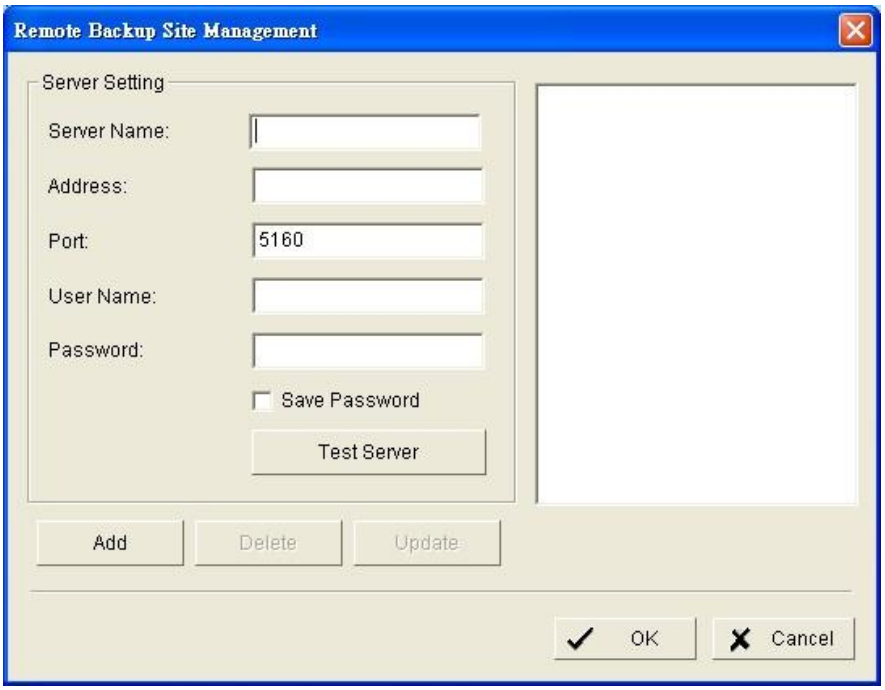
6.5 Delete the Recorded Video

6.5.1 With Backup Application

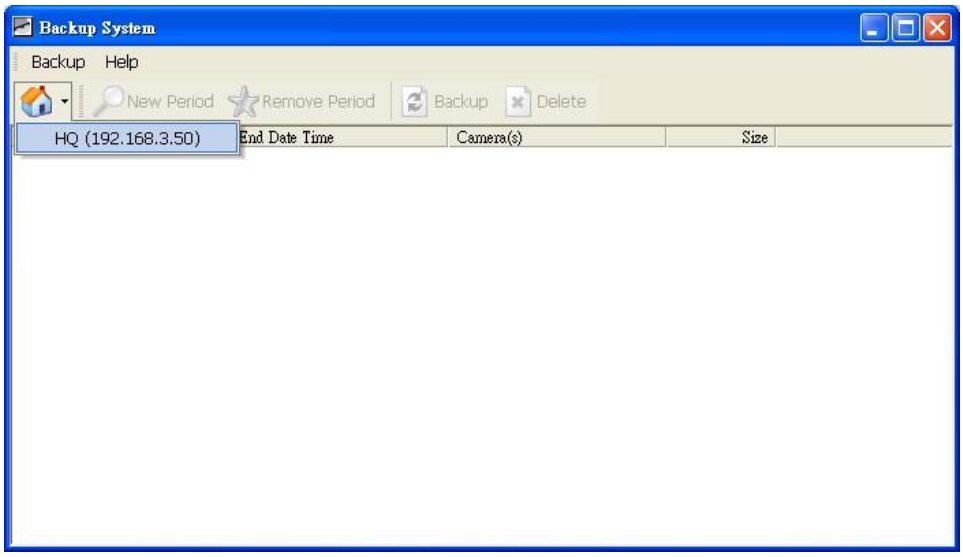
1. Startup > NUUO NVRmini > Backup System.



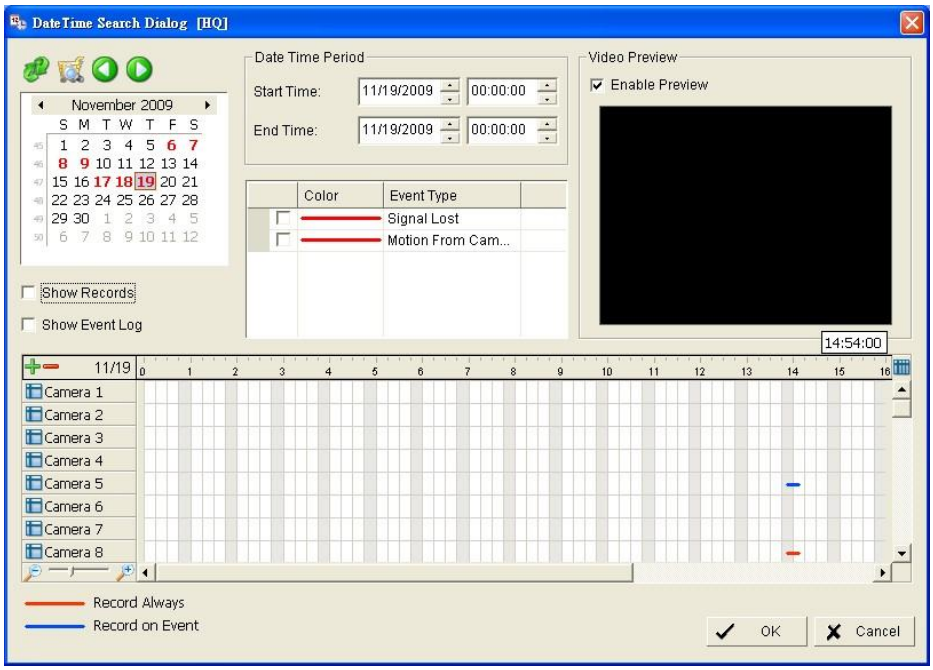
2. Click the **Remote Server Site** button to set up remote server.



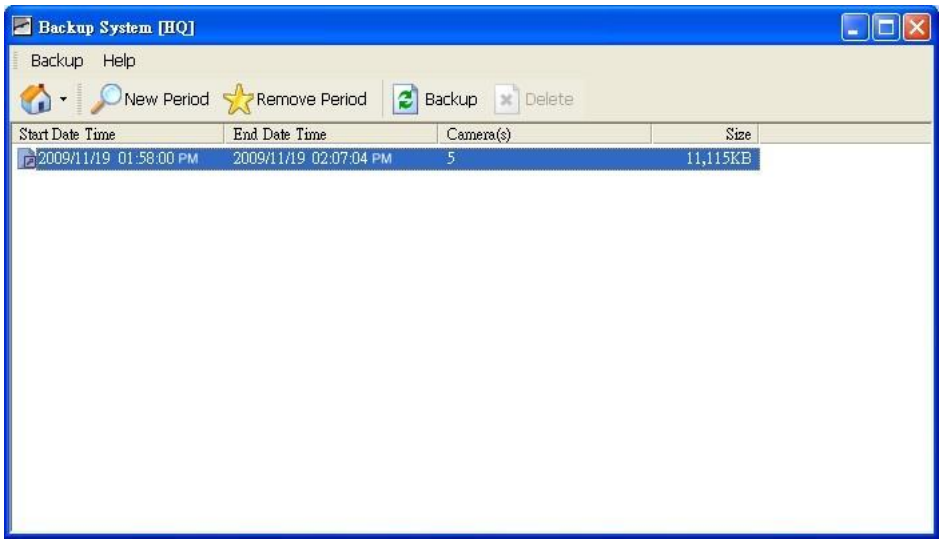
3. Insert the name of your unit.
4. Insert the IP address of that unit.
5. Modify the port if necessary.
6. Insert the user name.
7. Insert the password.
8. Check the **Save Password** option.
9. Click the **Test Server** button to test the connection between the local application and the remote unit.
10. Click the **Add** button to add this unit into the remote server list.
11. Click the **OK** button.
12. Click the ▼ button next to **Remote Server Site** button, and select one of servers you added.



13. Click the **New Period** button to select the record date.



14. Set the Start Time and End Time. (or highlight the video records which you want to delete)
15. Select the cameras you want to delete the records.
16. Click the **OK** button.
17. Select the time slot which you want to delete.



18. Click the **Delete** button.
19. Confirm the check dialog.

6.5.2 Without Backup Application

1. Find your unit through Windows Explorer (insert “\\” plus the IP address of your unit).
2. Use the administrator’s ID and password to log in.
3. Open the “videodata” folder.
4. Select the date folder which you want to delete.
5. Delete the folder.

Caution

In order to keep the system stable, do not delete recorded data from the day in which you do the delete process.

7. Verification Tool

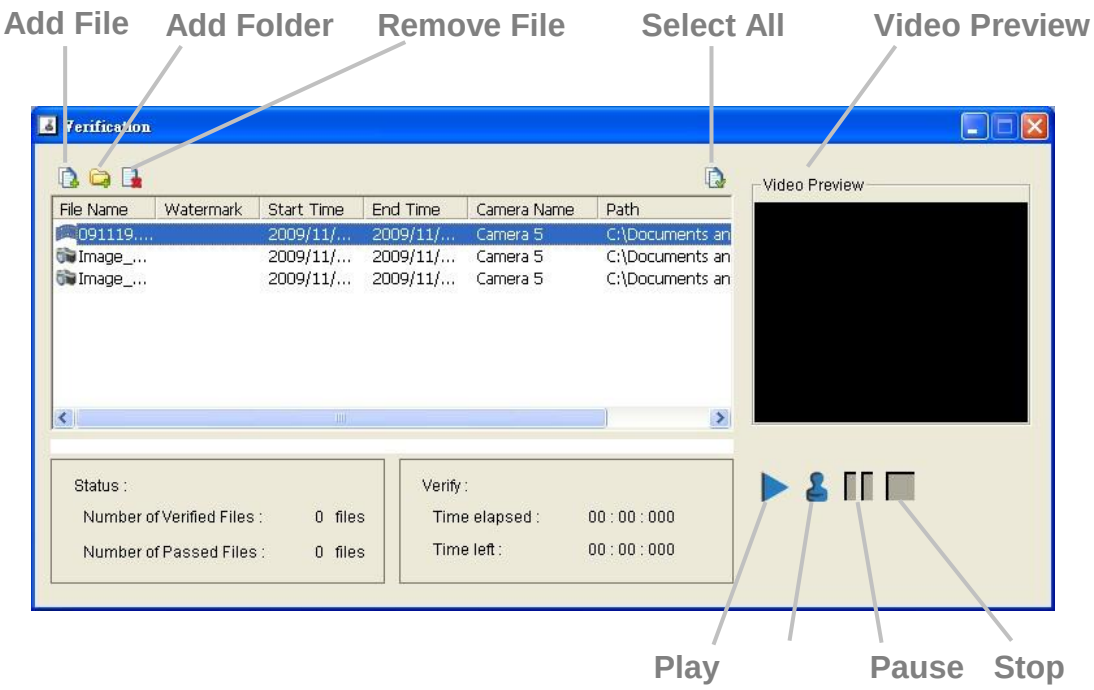
The Verification Tool verifies whether the data created by the system has been tampered with. It's the process by which a digital watermark (a digital signature) is added to each recorded video frame to ensure its authenticity.

There are three types of data could be verified by Verification Tool:

1. File in (.dat) (.264) format will be displayed as .
2. File in (.avi) (.asf) format will be displayed as .
3. File in (.bmp) (.jpg) format will be displayed as .

7.1 Execute Verification Tool

1. Startup > NUUO NVRmini > Verification Tool.
2. Verification Tool Overview



- **Add File**: Insert the single file to list for verification.
- **Add Folder**: Choose the folder with multiple files to list for verification.
- **Remove File**: Remove indicated file(s) from list.
- **Select All**: Select all files in list for verification.

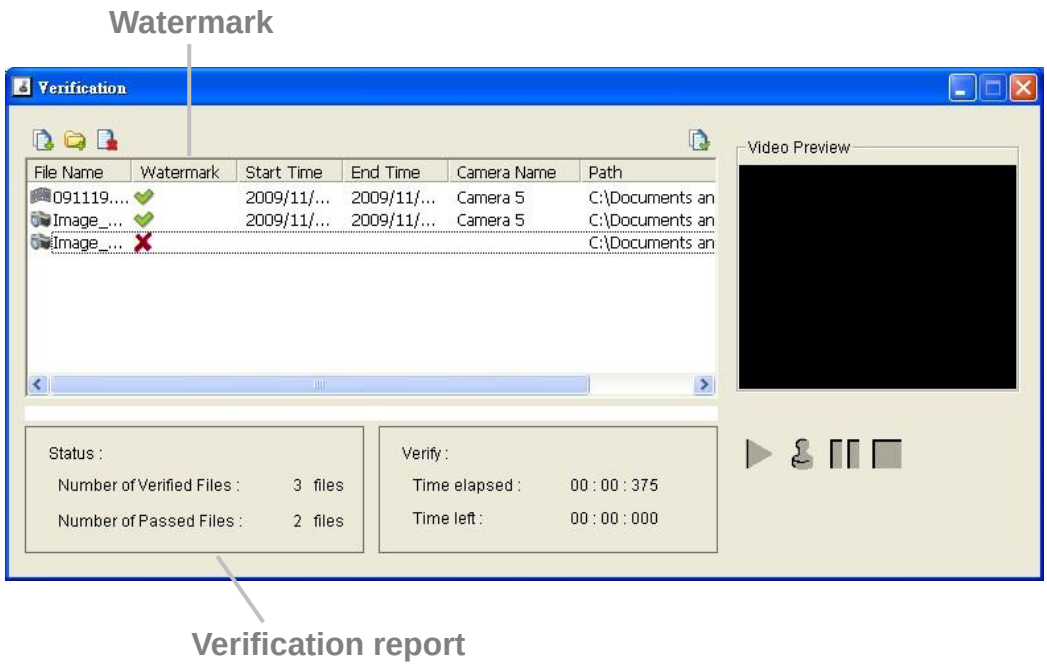
Note

Choose the file type first before selecting files. Only (.dat) (.264) (.avi) (.asf) (.bmp) (.jpg) are available to open.

- **Video Preview**: Preview designate file in verification list. Select the buttons below to play ▶, pause ❚❚, and stop ■ the video file.

7.2 Verify Image / Video

1. Select single or multiple files for verification.
2. Click the **Verify** button to start verification.
3. The verification result will show on watermark column. If a file was tampered with, it will show ✖; if a file passed verification, it will show ✔.



4. The verification report will indicate the information related to the verification.

8. Log out

Click the **Logout** button on the top of the page to log out of the system. If there is no action in 10 minutes, the system will log out automatically to avoid unauthorized access.

9. Remote PC System Requirements

Remote PC Minimum Requirements		
Model	2 bay (4 channels)	4 bay (8/16 channels)
OS Supported	Windows XP/ 2003/ Vista/ Win7	
CPU	Intel Core 2 Duo E5300	
RAM	1GB	
User Interface	1. HTTP Web browser - Internet Explorer 7 or later 2. Client Application Program	

10. Troubleshooting

10.1 Check the System Status LED

The system status LED reports the condition of the enclosure fan and power supply:

- **Green**: Normal
- **Amber**: There is a problem with the fan or power supply
- **Red**: The fan, power supply, or file system has failed

If your unit is configured to work with a UPS, it will continue to run for a while after a power supply failure.

10.2 Check Disk Status LEDs

The disk status LEDs report the condition of the disk drives:

- **Green**: Normal
- **Amber**: Rebuilding this disk drive
- **Red**: Failed disk drive
- **Dark**: No disk drive is installed

10.3 Replace a Failed Disk Drive

If a disk drive fails, the Disk Status LED becomes red. If the disk drive belongs to a RAID Volume, the Volume goes Critical or Offline. See **10.4 Check RAID Volume Status** for details.

Replace the failed disk drive with a new disk drive of the same or slightly greater capacity. You do not have to power down the unit.

1. Open the unit's front lid.
2. Pull out the drive carrier with the failed drive.
3. Remove the failed disk drive from the drive carrier.
4. Install a new disk drive into the carrier.
5. Place the carrier with the new disk drive back into the open slot in the

unit.

If the failed drive belonged to a RAID Volume, the RAID Volume will begin rebuilding as soon as the new drive is installed. During the rebuild, the Disk Status LED shows amber. When the rebuild is finished, the Disk Status LED turns green.

If the replacement drive is free, i.e., not assigned to a RAID Volume or as a spare, the Disk Status LED remains dark after you install the new drive.

10.4 Check RAID Volume Status

1. Click **RAID & File / RAID Management**.
2. Click the **RAID Status** tab.

10.5 Respond to a Critical RAID Volume

How the unit responds to a Critical RAID Volume depends on the RAID level of your Volume and whether you have a spare drive available:

- For a **RAID 1** Volume or a three-drive **RAID 5** Volume, if a spare drive is available, the RAID Volume begins rebuilding itself automatically.
- For **RAID 1, 5, and 10** Volumes, when no spare drive is available, you must replace the failed disk drive. The RAID Volume will begin rebuilding itself when you install the new disk drive. See **10.3 Replace a Failed Disk Drive** for details.
- **RAID 0** Volumes go offline after a disk drive failure. A **RAID 0** Volume cannot be rebuilt. All data on the Volume is lost.

10.6 Respond to an Invalid RAID Volume

The system considers a RAID Volume invalid when the RAID Volume was created by a different unit. However, the RAID Volume itself remains functional and the data on it is safe. It normally happens when a broken unit needs to be replaced, so as the recording work.

When the system does not recognize the RAID Volume, the unit displays

the RAID Volume as invalid.

Use the **Recover** function to validate the RAID Volume. The Recover tab is only active when an invalid RAID Volume is present and can be recovered.

1. Open Internet Explorer and log in to the unit.
2. Click **RAID & File / RAID Management**
3. Click the **Recover** tab.
4. On the **Recover** tab, click the option button beside the invalid RAID Volume.
5. Click the **OK** button.
6. The unit will reboot to update its configuration and recognize the RAID Volume.

Important

Running the Recover function might erase some or all of your settings. Besides backing up the recorded data before recovering, if that condition do happen, run the **Install Wizard** to set them again.

10.7 Check File System Status

Typically the first indication of a problem with the unit's file system is when your drive becomes unavailable.

1. Open Internet Explorer and log in to the unit.
2. Click **RAID & File / File System Management**.
3. Click the **File System Status** tab.
4. Look for the RAID Volume icon: . If the RAID Volume icon is Critical (has a yellow "!"), the file system contains errors and you must rebuild the file system.

10.8 Rebuild the File System

1. Open Internet Explorer and log in to the unit.
2. Click **RAID & File / File System Management**.
3. Click the **File System Status** tab.

4. Click the **RAID Volume Critical** icon to display the **Rebuild File System** button.
5. Click the **Rebuild File System** button.
6. In the confirmation box, type “YES” into the field provided, and then click the **OK** button.

10.9 Check Enclosure Status

1. Open Internet Explorer and log in to the unit.
2. Click **System / System Information**.
3. Click the **Enclosure Information** tab.
4. If CPU temperature is above specification:

- Be sure there is adequate air flow around the device.
- Be sure the ambient temperature is below 35°C (95°F).

5. Check the fan speed.

- If the fan speed is below 1800 RPM, contact Technical Support.
- If any power status is out-of-specification, contact Technical Support.

10.10 Restore the Default Administrator’s Password

If you forget the password, and want to reset the Administrator’s password to the default password: **admin**, follow the following steps.

1. Verify that the system is fully booted.
2. Insert your reset tool into the reset button hole on the back of the device.
3. Press and hold the reset button for 8 seconds, until the System Status LED flashes in green.
4. The Administrator’s password is now reset to **admin**.

Caution

Pressing and holding the reset button for 8 seconds will restore the default Administrator password.

10.11 Restore All Default Configuration

If you want to restore all configurations to default setting, follow the following steps.

1. Verify that the system is fully booted.
2. Insert your reset tool into the reset button hole on the back of the device.
3. Press and hold the reset button for 14 seconds, until the System Status LED keep the red light and then turn off.

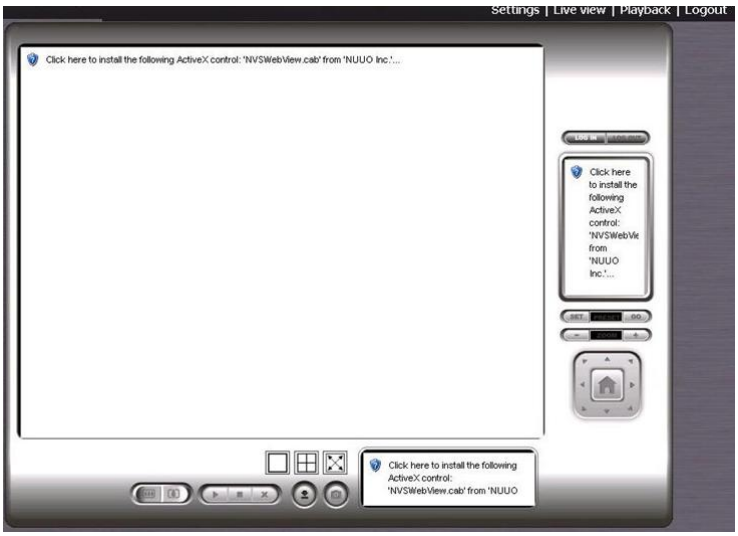
Caution

All the configurations including disk volume configure will be reset. To prevent from disks being unavailable, remember backing up the recorded data before resetting.

10.12 Install ActiveX

If you cannot see the complete page of the system when using Internet Explorer, it may be because the ActiveX installation process is not completed.

1. Open Internet Explorer and log in to the unit.
2. Click the **Live view / Playback** button on the top right.
3. The browser will ask whether to install ActiveX.

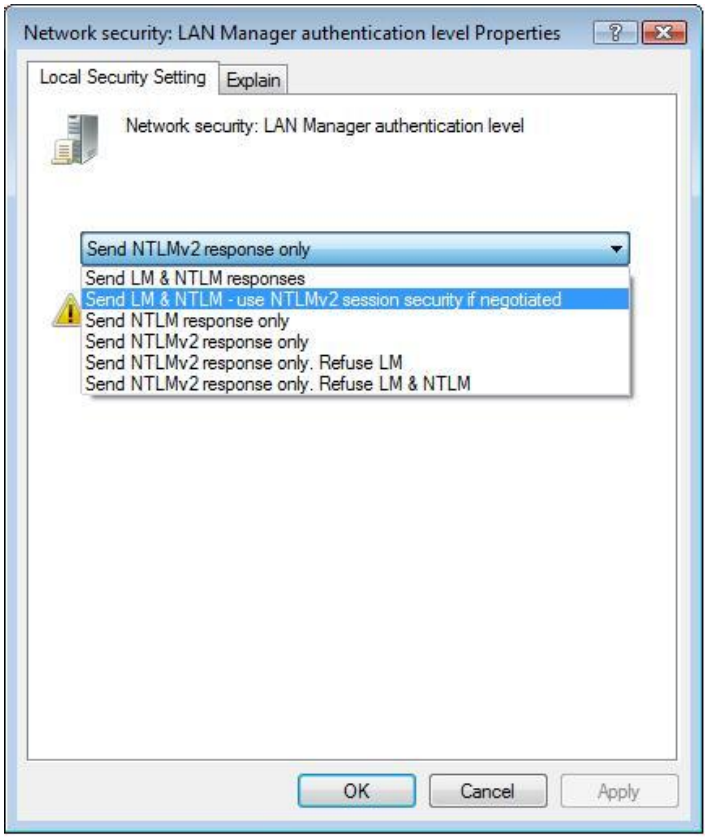

Settings | Live view | Playback | Logout
Click here to install the following ActiveX control: 'NVSWebView.cab' from 'NUUO Inc.'...
Click here to install the following ActiveX control: 'NVSWebView.cab' from 'NUUO

4. Click the upper bar to begin the installation process.
5. Click the **Install** button to complete the process.

10.13 Upgrade Process When Using Windows Vista

Windows Vista limits user authority, which will cause it to block any connection through Windows Explorer. In this case, you need to change Vista's settings to allow the connection.

1. Startup >Control Panel.
2. Select Administrative Tools.
3. Select Local Security Policy / Security Options.
4. Select "Network security: LAN Manager authentication level".
5. From the drop-down menu, choose "Send LM & HTLM – use NTLMv2 session security if negotiated".


Network security: LAN Manager authentication level Properties
Local Security Setting
Explain
Network security: LAN Manager authentication level
Send NTLMv2 response only
Send LM & NTLM responses
Send LM & NTLM - use NTLMv2 session security if negotiated
Send NTLM response only
Send NTLMv2 response only
Send NTLMv2 response only. Refuse LM
Send NTLMv2 response only. Refuse LM & NTLM
OK
Cancel
Apply

6. Find your unit through Windows Explorer (insert "\\" plus the IP address of your unit).
7. Use the administrator's ID and password to log in.

8. Put the update file into the folder “public” in your unit.
9. Open Internet Explorer and log in to the unit.
10. Click **System / System Upgrade**.
11. Click the **Firmware Upgrade** tab.

12. Choose the volume.
13. Choose the folder “public”.
14. Select upgrade file or insert the entire file name, including the extension name.
15. Click the **OK** button.
16. The system will begin the upgrade process.
17. After upgrade, the system will reboot. You need to re-access the unit again.

10.14 Cannot Playback When Applying Windows 2000

1. Check whether you have installed Media Player or not.
2. If you have installed Media Player, check whether its version is version 9 or later.

10.15 Cannot Log in to the Unit with Internet Explorer

1. Check the settings of your antivirus software.
2. Change to appropriate settings or turn off this antivirus software.

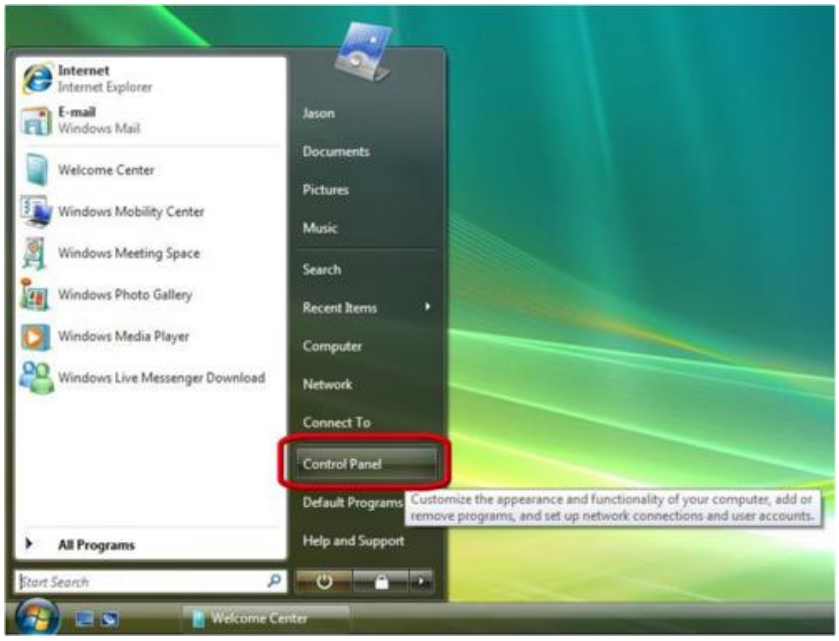
10.16 UAC on Windows Vista

Vista has a feature called UAC (user access control) to improve the security of Microsoft Windows by limiting application software to standard

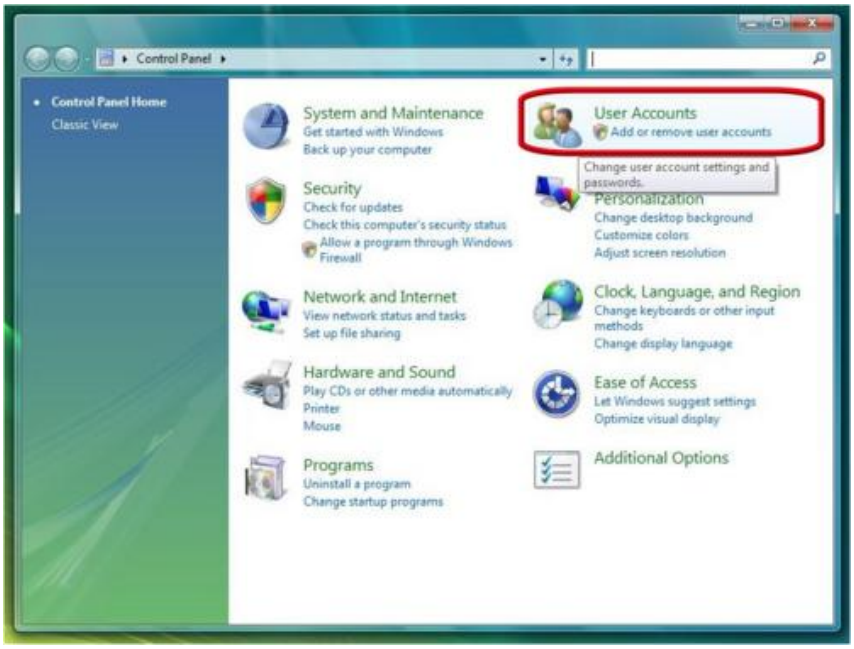
user privileges until an administrator authorizes an increase in privilege level. Therefore, you will get error message when running the system while Vista UAC turned on. There are two ways to solve this problem.

10.16.1 Turn off UAC on Windows Vista

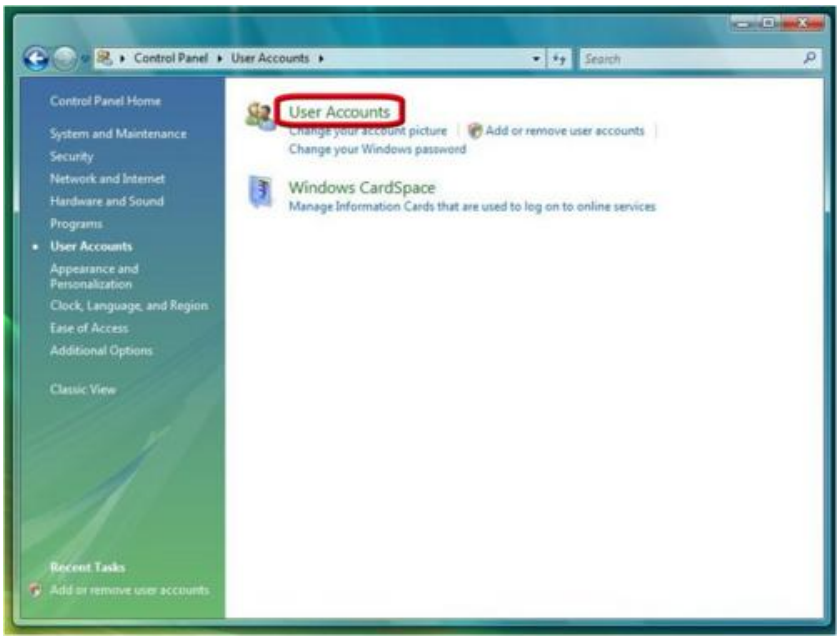
3. Go to **Control Panel** on Vista



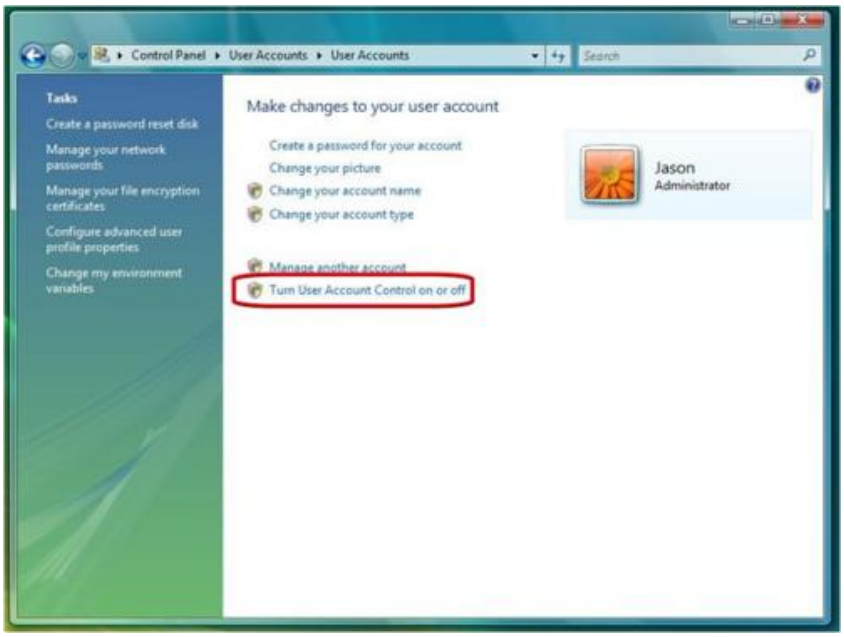
4. Click **User Accounts**



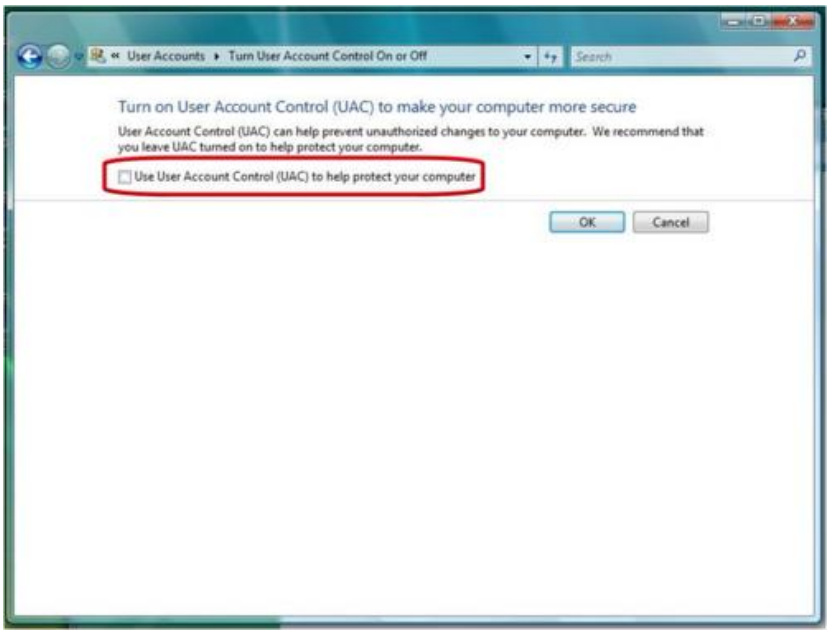
5. Click **User Accounts**



6. Click **Turn User Account Control on or off**

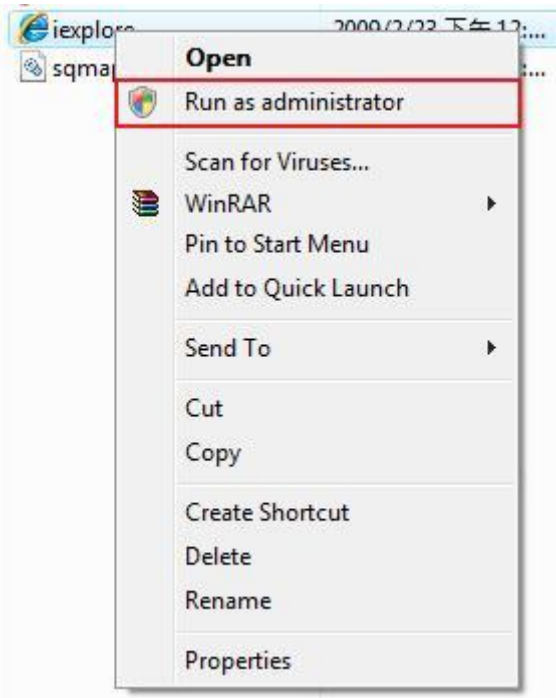

Control Panel ▸ User Accounts ▸ User Accounts
Search
Tasks
Create a password reset disk
Manage your network passwords
Manage your file encryption certificates
Configure advanced user profile properties
Change my environment variables
Make changes to your user account
Create a password for your account
Change your picture
Change your account name
Change your account type
Manage another account
Turn User Account Control on or off
Jason
Administrator

7. Click to deselect the **Turn User Account Control on or off** box to turn off UAC
8. Click **OK** and restart Windows to complete the new setting


User Accounts ▸ Turn User Account Control On or Off
Search
Turn on User Account Control (UAC) to make your computer more secure
User Account Control (UAC) can help prevent unauthorized changes to your computer. We recommend that you leave UAC turned on to help protect your computer.
Use User Account Control (UAC) to help protect your computer
OK
Cancel

10.16.2 Enable Privilege Level of Internet Explorer

5. Go to C:\Program Files\Internet Explorer
6. Right click on iexplore.exe
7. Select “Run as administrator” and then the system will be prompted to run IE browser
8. You will be able to use the system after downloading ActiveX while Vista UAC turned on



10.17 Install Wizard Issue on Windows Vista

Because of the hotfix change of Microsoft Windows Vista, users are likely unable to find any device by Install Wizard with Vista OS system. This sudden change of the dynamic ports made the impact to a lot of software providers, not only to our system. You can follow one of the solutions below.

10.17.1 FW Upgrade

For the existing customers, upgrading FW v2.0 is the permanent way to fix the issue. However, version 2.0 Install Wizard is able to search the system with FW v2.0; while version 1.3 Install Wizard is able to search the system with FW 1.3 or previous versions.

10.17.2 Workaround

If you are failed to search system with FW v1.3, please follow the steps below.

1. Conduct in command mode
   netsh int ipv4 set dynamicport tcp start=10000 num=1000
   and
   netsh int ipv6 set dynamicport tcp start=10000 num=1000

2. Check if it's revised successfully
   netsh int ipv4 show dynamicport tcp
   and
   netsh int ipv6 show dynamicport tcp

This workaround solution is issued by Microsoft, for eliminating the issues caused by them. http://support.microsoft.com/kb/929851

Note

Before conducting Install Wizard, remember to put your PC and the unit in the same LAN (the same network, no need to be through the same switch).

Please visit NUUO wiki for more information.
http://192.168.1.141/mediawiki/index.php/NVRmini

Appendix – RAID System

Introduction to RAID

RAID (Redundant Array of Independent Disks) allows multiple disk drives to be combined together into a RAID Volume. You will create a RAID Volume on your unit when you perform the setup procedure.

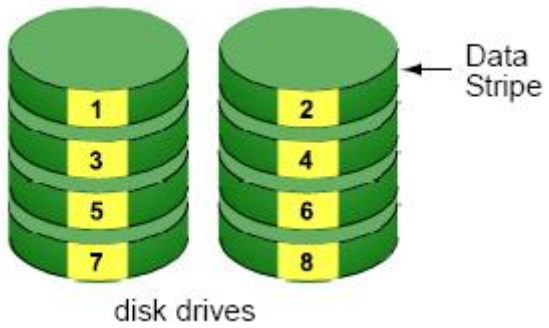
The benefits of a RAID can include:

- Higher data transfer rates for increased server performance
- Increased overall storage capacity for a single Volume
- Data redundancy/fault tolerance for ensuring continuous system operation in the event of a disk drive failure

Different RAID levels use different organizational models and have varying benefits. The following outline breaks down the properties for each RAID level supported on this unit:

RAID 0 – Stripe

When a RAID Volume is striped, the read and write blocks of data are interleaved between the sectors of multiple disk drives. Performance is increased, since the workload is balanced between drives or “members” that form the RAID Volume. Identical drives are recommended for performance as well as data storage efficiency.



The RAID Volume’s data capacity equals the capacity of the smallest disk drive times the number of disk drives. For example, one 100 GB and three

120 GB drives will form a 400 GB (4 x 100 GB) RAID Volume instead of 460 GB.

If disk drives of different capacities are used, there will also be unused capacity on the larger drives.

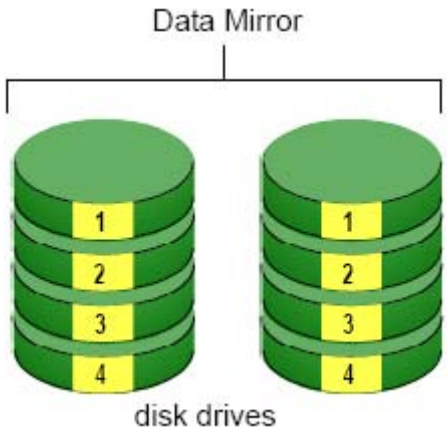
Because RAID 0 does not offer Fault Tolerance, meaning that you cannot recover your data after a disk drive failure, we do not recommend a RAID 0 Volume for your unit.

RAID 0 Volumes on this unit consist of one or more disk drives.

RAID 1 – Mirror

When a RAID Volume is mirrored, identical data is written to a pair of disk drives, while reads are performed in parallel. The reads are performed using elevator seek and load balancing techniques where the workload is distributed in the most efficient manner. Whichever drive is not busy and is positioned closer to the data will be accessed first.

With RAID 1, if one disk drive fails or has errors, the other mirrored disk drive continues to function. This is called Fault Tolerance. Moreover, if a spare disk drive is present, the spare drive will be used as the replacement drive and data will begin to be mirrored to it from the remaining good drive.



The RAID Volume's data capacity equals the smaller disk drive. For example, a 100 GB disk drive and a 120 GB disk drive have a combined

capacity of 100 GB in a mirrored RAID Volume.

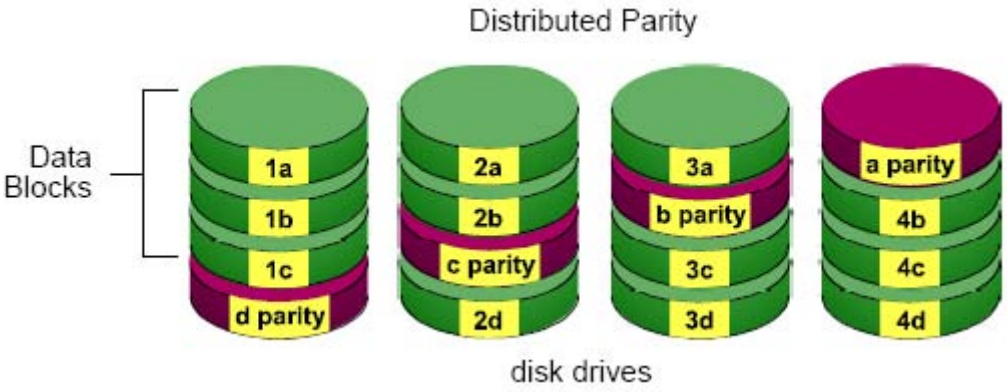
If disk drives of different capacities are used, there will also be unused capacity on the larger drive.

RAID 1 Volumes on this unit consist of two disk drives.

If you want a mirrored RAID Volume with more than two disk drives, see **RAID 10 – Mirror / Stripe** for details.

RAID 5 – Block Striping with Distributed Parity

RAID 5 organizes block data and parity data across the disk drives. Generally, RAID level 5 tends to exhibit lower random write performance due to the heavy workload of parity recalculation for each I/O. RAID 5 works well for file, database, application and web servers.



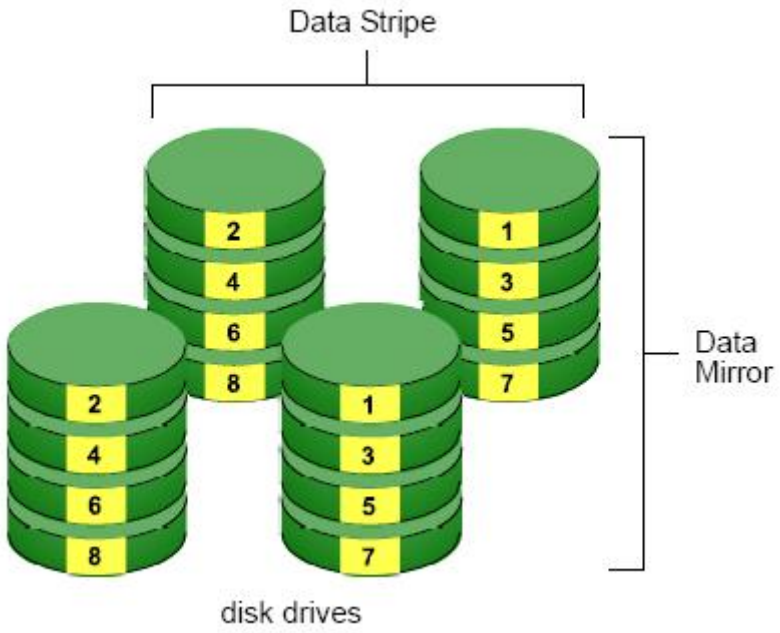
The capacity of a RAID 5 Volume equals the smallest disk drive times the number of disk drives, minus one. Hence, a RAID 5 Volume with four 100 GB disk drives will have a capacity of 300 GB. A RAID Volume with two 120 GB disk drives and one 100 GB disk drive will have a capacity of 200 GB.

RAID 5 is generally considered to be the most versatile RAID level.

RAID 5 requires a minimum of three disk drives.

RAID 10 – Mirror / Stripe

Mirror/Stripe combines both of the RAID 0 and RAID 1 types. RAID 10 can increase performance by reading and writing data in parallel while protecting data with duplication. At least four disk drives are needed for RAID 10 to be installed. With a four-disk-drive RAID Volume, one drive pair is mirrored together then striped over a second drive pair.



The data capacity RAID 10 Volume equals the capacity of the smallest disk drive times the number of disk drives, divided by two.

In some cases, RAID 10 offers double fault tolerance, depending on which disk drives fail.

RAID 10 Volumes on this unit consist of four disk drives.

Because all of the available disk drives are used for the RAID Volume, you cannot set up a spare drive with RAID 10.

Choosing a RAID Level

There are several issues to consider when choosing the RAID level. The

following summarizes some advantages, disadvantages and applications for each choice.

- **RAID 0**

Advantage	Disadvantage
• Implements a striped disk RAID Volume, the data is broken down into blocks and each block is written to a separate disk drive • I/O performance is greatly improved by spreading the I/O load across many channels and drives • No parity calculation overhead is involved	• Not a true RAID because it is not fault tolerant • The failure of just one drive will result in all data in a RAID Volume being lost • Should not be used in mission critical environments

- **RAID 1**

Advantage	Disadvantage
• Simplest RAID storage subsystem design • Can increase read performance by processing data requests in parallel since the same data resides on two different drives	• Very high disk overhead - uses only 50% of total capacity

- **RAID 5**

Advantage	Disadvantage
• High Read data transaction rate • Medium Write data transaction rate • Good aggregate transfer rate • Most versatile RAID level	• Disk failure has a medium impact on throughput

- **RAID 10**

Advantage	Disadvantage
• Implemented as a mirrored RAID • Volume whose segments are RAID 0 RAID Volumes • High I/O rates are achieved thanks to multiple stripe segments	• Very high disk overhead – uses only 50% of total capacity

Spare Drives

A spare is a disk drive that has been designated to replace a failed disk drive in a RAID Volume. In the event of the failure of a disk drive within a RAID 1 or three-drive RAID 5 Volume, the spare drive is activated as a member of the RAID Volume to replace a disk drive that has failed.

A spare drive cannot replace the failed drive in a RAID 0 Volume because of the way in which data is written to the disk drives under RAID 0.

A spare drive is not available for a RAID 10 Volume because RAID 10 requires all four disk drives in the unit enclosure. However, when you replace the failed disk drive, the unit will automatically rebuild the RAID Volume using the new disk drive.

You must designate a disk drive as a Spare. Use the system to designate the Free disk drive as a Spare.

Maintaining a spare drive is a good precaution to protect your RAID Volume integrity in the event of disk drive failure.

Automatic Rebuilding

When a disk drive in your RAID 1, 5, or 10 Volume fails, and a replacement disk drive becomes available, the RAID Volume will rebuild itself to the new disk drive automatically.

For RAID 1 and three-drive RAID 5 Volumes, you can designate a spare drive. If a spare drive is present when the RAID Volume experiences a disk drive failure, the rebuild will start automatically using the spare drive.

For RAID 1, RAID 5, and RAID 10 Volumes without a spare drive, the RAID Volume will begin to rebuild itself automatically when you remove the failed disk drive and install a new disk drive.

A RAID 0 Volume cannot be rebuilt because of the way in which data is written to the disk drives under RAID 0. Even if there is a designated spare

drive, rebuilding is not possible for RAID 0 Volumes.

RAID Volume Migration

Migration is the process of:

1. Changing the RAID level
2. Adding disk drives but keeping the same RAID level

In the migration process, the existing RAID Volume is called the Source. The proposed RAID Volume is called the Target. Each target RAID Volume has certain requirements and they are different for each RAID level. You must meet all of the requirements in order to successfully migrate a RAID Volume.

In most cases, you must add one or more disk drives during the migration process. You can never reduce the number of disk drives.

While the migration is running, you can still access the folders on your RAID Volume and the data they contain.

The following tables show the migration options for a source RAID Volume according to its RAID level. The available target RAID levels are shown with their requirements.

- **RAID 0**

A RAID 0 source Volume can migrate to the following target RAID levels:

Target	Requirement
RAID 0	Add disk drives.
RAID 1	2 disk drives minimum. A 1-drive RAID 0 can’t migrate to RAID 1. To do this, add 1 disk drive.
RAID 5	3 disk drives minimum. At least 1 more disk drive than the RAID 0 RAID Volume.

- **RAID 1**

A RAID 1 source Volume can migrate to the following target RAID levels:

Target	Requirement
RAID 0	Can use same number of disk drives.
RAID 5	3 disk drives minimum. At least 1 more disk drive than the RAID 1 RAID Volume.

- **RAID 5**

A RAID 5 source Volume can migrate to the following target RAID levels:

Target	Requirement
RAID 0	Can use the same number of disk drives.
RAID 5	Add a disk drive.

- **RAID 10**

A RAID 10 source Volume cannot migrate or add more disk drives.

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